THE

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A Monthly Magazine of Practical Information and Useful Discussions

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The Wealth of India.

The object of this Monthly is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensable to statesman, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

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Current Topics

BY ECONOMICUS.

Recent Financial Crisis.

It is yet difficult to estimate in Rs., As. and Ps. the loss in which the country has been involved by the recent financial crash that suddenly came over a large number of indigenous banking, commercial and industrial concerns. That it must be enormous is obvious. But even more important and significant than the actual monetary losses sustained by individuals and institutions and firms are the far-reaching effects of the crisis upon the industrial and economic progress of the people. Financial crises are to a community what fevers are to the human body. They come occasionally and, after a certain period, are shaken off. They are, however, dangerous to a community situated as the Indian is, which is new to joint stock banking and industries conducted on a large scale and according to modern methods. Capital is not very copious in India and is very shy. The failure of a number of Indian managed banks and other concerns is bound to shake the confidence of the public and they will be unwilling to part with their money, however tempting the promise of interest and other advantages held out to them. Swadeshi enterprise the position of which is by no means very satisfactory, cannot but receive a set back. Measures have therefore to be taken to restore public confidence which is one of the most important factors in industrial and economic development. The failure of so many purely Indian managed concerns has been utilized by

certain people to show that Indians are unfit to carry on the banking business. The continued existence and prosperity of a large number of banking firms in all parts of the country, of course, of the old type, at once shatters this theory to pieces. Some classes in India have a peculiar genius for banking business and if people in this country are new to joint stock banking, the lesson of the latest financial disaster is not to stop or discourage that business but only to provide safeguards ensuring sound methods. The official mind of Simla or rather Delhi does not appear to have been made up on the question of the proposed investigation into the condition of the banks which have come to grief. Out of the half-a-dozen banks which suspended payment owing to a rush of depositors, some will have their affairs scrutinized by the orders of the courts and the methods of management pursued by the others will, in one way or another, be exposed to public view. There is a divergence of opinion as to whether Government should not undertake legislation to control banking operations carried on in this country in various forms. In our last number, we published a letter addressed by the Government of India in the Department of Commerce and Industry, to Local Governments and administrations and commercial bodies asking their views on the question of the proposed restrictions on banking. Government make it clear that they recognize the desirability of not interfering with really legitimate banking business and propose to place restrictions upon 'banks,' a a name that will be confined to concerns that are registered companies. The restrictions that have been suggested in the letter are fully worthy of consideration and relate to the size of paid-up capital and reserve, and the nature of a bank's investments and scope of its operations. As is contended by some critics, legislation cannot go far in regulating the affairs of banking institutions along safe lines, and ultimately salvation lies in the wide awakeness of depositors and shareholders and the business capacity and integrity of the management. The law can, however, do something to protect the interests of the public and minimise the chances of bank failures. We believe an impartial and strict investigation by Government into the condition and methods of the banks which have lately collapsed will prove highly instructive and helpful. It will show the pitfalls of bank managers and expose their unsound methods. As a contemporary observes, a Government inquiry would do more than any thing else to restore confidence in those Indian banks which have survived the storm or help to point out their weak spots. 'An inquiry would probably lead to some painful revelations but it would be better that the whole truth should be known as soon as possible than that the present conditions should be allowed to continue indefinitely with Government looking on in apparent indifference.'

The After-math. Though one need not have been specially endowed with a prophetic vision to foresee that the infection of the bank disaster in the Punjab would spread over a wide area, none would certainly have predicted the havoc, the financial hurricane has wrought in Karachi and Bombay. Luckily the eastern and the southern provinces have escaped from the calamity of the crisis, but commercial and industrial concerns in the above-named places have been hit very hard. Not a day passed for weeks without bringing its news of failures. Firm after firm in Karachi has had to close its doors owing to its inability to meet obligations as they became due. In a time of panic banks naturally sat tight upon their treasuries and credit it was absolutely impossible to obtain. Stringency of money was obviously the cause of the failure of several firms of long standing and good repute. Trade was in a most flourishihg condition and large orders had been placed by merchants for pieces-goods and other articles in the legitimate expectation of reaping a rich harvest. But the prospect was suddenly clouded when credit was inordinately restricted. Panic spread like wild fire, public confidence was gone and a number of concerns had to shut down. The air was

thick with rumours of various sorts, of impending calamities and imminent failures. The crisis was not confined to any particular branch of business: monetary stringency and distrust were fatal to all and sundry. The total loss will have to be counted in crores and the financial crisis is calculated to become classical. The failure of the Credit Bank in Bombay had a tremendously baneful effect upon the Bombay Share Bazaar. The atmosphere was overcharged with rumours and suspicions and it was believed that certain leading share brokers were heavily involved. The failure of Mr. Jehangir Bahramji Dalal,—whose liabilities were estimated to be over Rs. 24,00,000,—which was calculated to affect the position of a number of other brokers of good status and long standing, enhanced the panic and there was feverish excitement in the money market. An idea of the loss involved in this crisis in the share bazar, the Wall Street of Bombay, may be formed from the fact that the amount of money invested in mill shares alone through the brokers of the Bazar is stated to be over six crores of rupees. The recent crisis recalls the great share mania in Bombay of the sixties of the last century when the late Mr. Prenchand Roychand, the financial giant, commemorated in Mr. Wacha's thrilling book, figured prominently in the crash which overwhelmed thousands in its distressing ruins. The panic in Bombay became so dreadful that the share bazar had to be closed for a few days to allow things to cool a bit. The crisis was the result of share speculation carried on on an enormous scale and the contention of the 'bear' and 'bull' operators. Heavy fictitious sales of shares had been made by the bears and the fall in the rates, especially owing to bank failures and vague rumours connected therewith, was rapid and was, in certain cases, over 50 per cent. The bears were jubilant, the bulls exactly the opposite. But at a time of confusion and financial failure everybody stood to lose to a smaller or greater extent and the Board of Directors of the Share Brokers' Association was appealed to to take measures to bring order out of the confusion. The brokers met as well as the Board. There were hot words and intense excitement. The bears came in for a good deal of angry censure as being the prime cause of the crisis. The absence of the chairman of the Association, Sir Shapurji Broacha in England, was deeply felt. There were, however, cool heads among the brokers and they counselled calm consideration of the situation. The solution of the difficulty lay in adopting the principle of give and take. The Board of Directors after careful deliberation fixed certain rates for the principal seven mill shares and the brokers were exhorted to effect the Moorat or Devali Settlements on that basis. The rates were, of course, not binding upon the brokers, many of whom refused to accept them. The share bazar was however opened and several transactions took place. There was a visible tendency to confine the share dealings to cash transactions only. The excitement was not, however, over, and no one knew what turn things would take. Normal conditions could be restored only after the bazaar had gone through very painful experiences which will be remembered long after the crisis has become a thing of the past. Like the bank failures, the ordeal through which the Bombay share market has passed, has important lessons to teach and it behoves all those concerned to take them deeply to heart.

The Finance Commission.

The Chamberlain Commission has done well to publish the whole mass of evidence and other valuable information supplied to it till 6th August. It will provide an amount of food for thought to students of Indian finance but we are afraid it is yet too early to form any definite opinion about the conclusions which the Commission is likely to arrive at. The London *Times* has, however, hastened, in summing up the general results of the evidence, to say that they will satisfy most people that there has been clear exaggeration in the criticisms of the Indian financial arrangements. The paper proceeds to observe that barring the redoubtable Mr. M. de. P. Webb,

every witness was in favour of keeping the gold standard reserve in London. On the whole, opinion seems to be divided on the question of the proposed State Bank for India and the establishment of a gold mint finds little support. The Commission, before it adjourned, examined in all twenty-two witnesses, four representing the India office, twelve non-official Anglo-Indian bankers and merchants, one non-official English banker, two Anglo-Indians representing the Indian Government, one retired Anglo-Indian official, one Indian official and one Indian non-official. It is difficult to suppose that the criticisms of the India Office methods of finance which mainly led to the appointment of the Commission were all unmitigated exaggerations, and that those methods will come unscathed out of their trial. There is hardly any unanimity among the Anglo-Indian bankers and merchants who while agreeing on a question like that of the cash balances, for instance, are at variance with respect to the other subjects. Indian witnesses like Messrs. Chunilal Saraya and Dalal of Bombay have yet to give their evidence. It would, therefore, be desirable to suspend one's judgment on the questions at issue and wait for the final report of the Commission. The most important witness examined by the Commission was Mr. Lionel Abrahams, the Assistant Under Secretary of State. His evidence, as might have been expected, went to defend the India office management of Indian finance in almost all particulars. Messrs. Toomey and Fraser, representatives of the Exchange Banks, were opposed both to a State Bank and a gold mint but were of opinion that the Government of India might lend to the Presidency Banks part of the surplus balances for the benefit of trade in busy seasons at something below the bank rate. There was divergence of view as to whether the loans should be made out of the currency reserve or out of the surplus cash balances and whether or not the two reserves might not be amalgamated. Mr. M. R. Sundara Aiyar, Secretary, Madras Economic Association, disapproved of the proposal about a gold mint, observing that every sovereign that the people could obtain would go into the melting pot for ornaments. This conflict of opinion is expected from the divergent interests that are represented by the witnesses invited to tender their evidence and the task before the Commission is by no means easy. It is therefore premature to lay down definite propositions either one way or the other before the whole evidence is recorded.

We give elsewhere in the 'Financial World' a special summary of the evidence tendered by the witnesses on the question of State Bank for India. Summaries of the evidence on the other points will appear in future issues as space permits.

Gold Circulation in India.

The desirablity of opening a gold mint in India which was urged on the attention of the Secretary of State in a well-reasoned despatch by the Government of India some time ago is one of the important questions which are at present engaging the attention of the Finance Commission. The views of the witnesses appearing before it are being elicited and from the evidence which has been so far recorded, it appears the bulk of the opinion, is against the proposal of an Indian gold mint The Exchange Banks do not want it. Mr. Abrahams representing the India office does not see any necessity for it, and Mr. Aiyar of the Local Economic Association is of opinion that every sovereign issued out of it would go into the melting pot for the purpose of ornaments So far as we know, and we have no prepossessions on either side, nobody has ever said that sovereigns are very popular as a currency in India at the present moment or are likely to be in the immediate future. The position of Mr. Webb and other advocates of a gold mint is that the existing currency system in India is based upon the recommendations of the Fowler Committee and one of these was that a steady attempt should be made, in time, to introduce a gold currency. It is therefore urged that the establishment of a gold mint in this country will facilitate the attainment of this object by increasing the portion of gold in the Indian

currency. The Government of India are likewise of opinion that an Indian gold mint will have this effect and it will besides strengthen the hands of government in the matter of exchange. Whatever view the Royal Commission may take of the question, it is interesting in the meantime to know how far the sovereign is gaining in popularity, to what extent the coin is being used as currency and to what extent sovereigns are being hoarded or melted. Reliable evidence on all these points is not easy to obtain, but the Currency Department is in a position to find out the extent of the absorption of gold in the various provinces. Mr. Gauntlett's report for the year 1912-13 says that the net issues of gold in busy seasons exceeded those of silver in the Punjab. In the Bombay Circle, they were nearly half and in Cawnpore about one-third. The total absorption of gold was 40 per cent in excess of that of silver. The total absorption was 10¼ millions sterling or more than one third in excess of 1911-12, there having been an increase in every province. The Punjab increase was 60 per cent., U. P. 50 per cent., Bengal and Burma 50 per cent., Bombay 14 per cent. The Punjab took 3·3 millions, the other provinces taking nearly 1½ million sterling each. The department continued its inquiry into the exact use of these sovereigns, and it was found that in Bengal they were used for melting, hoarding and Mecca pilgrimage. In the Central Provinces sovereigns are used by foreign merchants but not for financing crops. In Burma they are usely mainly for melting but partly for circulation. In the United Provinces, we are told, the popularity of gold currency is largely increasing owing to portability. The Punjab shows daily increase of popularity. In Madras the circulation and absorption are mainly on the West Coast and in Bombay there is a growing popularity and increased inclination of cultivators to accept gold for crops. In many parts of the latter province it is not much hoarded but used for currency and remittance. This evidence cannot certainly be characterised as particularly positive in favour of the use of sovereigns as currency by the mass of Indian people, though there is a distinct and a growing inclination among them in that direction. The Chamberlain Commission will not recommend, if one may be allowed to anticipate, any drastic changes in the existing system of Indian currency. At any rate, it is not going to suggest the desirability of opening the Indian mints to silver and gold must remain the basis of our system. If that is so, may we not go along the lines laid down by the Fowler Commission and develop the policy initiated in 1899? If, however, we are going to have what is called the 'honest rupee,' and everything that accompanies it, we need not bother ourselves about gold circulation and a gold mint.

Indian Post Office. The annual report of the Indian Post office for the year 1912-13 shows an all round progress which is quite gratifying. It is seen from the facts and figures given in the report that the public is taking more and more advantage of the facilities offered by the Post office. Looking at the statement showing the business of the Post Office Savings Bank, we notice that there were 1,566,860 accounts in existence on March 31st 1913, a net increase of 66,026 or 4·39 per cent over the figure for 1911-12. The total amount at the credit of depositors at the close of the year exceeded 20 crores 61 lakhs, which is higher by one crore 71 lakhs or 9·05 per cent, than the balance at the close of the preceding year. The average balance at the credit of each depositor was Rs. 131·55 in 1912-13 as against an average of 125·92 in the year previous. Coming to postal circles we find that the average balance per depositor is highest in Bombay, viz., Rs 168 43 and lowest in Madras, viz., 67·84. The Punjab and the North-Western Frontier Province come next with 155 37 and the United Provinces, the Central Provinces, and Eastern Bengal and Assam follow with 150·79, 145·66 and 145·27 respectively. Why does Madras lag behind the sister provinces in this matter? Is it owing to the fact that people here resort more to other ways of depositing their savings or that

the majority of them are, on an average, poorer than their brethren elsewhere, or still that they love to put their money in ornaments, in boxes and so on? The number of accounts is not small; there were in existence at the end of the last official year no less than 224,189 active accounts as compared with the 1,84,226 in the United Provinces 78,812 of the Central Provinces. It would be interesting to try to find out why this Presidency cuts such a low figure in this matter. The total number of money orders issued during the year under report was 29,618,584, compared with 27,243,409 of the preceding year and the total amount exceeded Rs. 52¼ crores as compared with Rs. 48¾ crores in 1911-12. These totals include figures for inland as well as foreign money orders. In the matter of money orders this province occupies a favourable position. Taking only the Inland (ordinary and telegraphic) money order transactions, we see that Bengal shows the highest figures, more than 8½ crores worth of money orders being issued and about 11 crores worth being paid in that Province. Madras comes next with more than Rs. 6¼ crores and Rs. 7¼ crores respectively.

Special Articles.

AMERICAN BANKERS AND AMERICAN AGRICULTURE.

BY E. DAVENPORT, *Dean of the College of Agriculture, University of Illinois, U.S.A.*

The agriculture of the United States of North America is undergoing rapid development due indirectly to the activity of the colleges and experiment stations in every State of the Union supported jointly by federal and State funds. The teachings of these institutions in the last ten years have turned the attention of the American farmer from the art of agriculture to the science, and these teachings have appealed with special strength to men of far-reaching vision and financial acumen,—to none more than to bankers, many of whom, especially in the Mississippi valley, are themselves large landholders.

The state of Illinois lies in the heart of the so-called corn belt of the Mississippi valley. Most of its bankers were originally farmers and are still extensive landholders. They are therefore directly and personally interested in the promotion of agriculture. In 1908, Mr. B. F. Harris, Vice-President of the First National Bank of Champaign, Illinois, the site of the State University, and a member of the Executive Council of the State Bankers' Association, took the position publicly that the bankers of the state should stand officially for a permanent agriculture, having in mind not temporarily increased crop production but that ultimate welfare of the soil which would insure increasing rather than decreasing future returns. So far as I know, this was the first time that a banker as such ever made an official statement concerning agriculture. The next year, Mr. Harris, then chairman of the of the Executive Council, induced that body of men to declare officially for the use of ground limestone and rock phosphate on the soils of Illinois in preference to the more expensive mixed commercial fertilizers. The following year, he became President of the Association and at his suggestion there was created a standing committee on agricultural and vocational education.

About this time, a similar interest developed in Minnesota in conection with an eductional bill providing for instruction in agriculture in the public schools of the state. Mr. Joseph Chapman of Minneapolis became a leader in this movement, which took a somewhat different turn from the one in Illinois in that the chief interest developed about agricultural education. Mr. Harris and Mr. Chapman issued calls almost simultaneously to the neighbouring states, asking them to join in the bankers

movement for a better agriculture. In as much as Mr. Chapman's date of meeting was earlier than that of Mr. Harris, the latter cancelled his call, and the first general bankers' meeting was held in Minneapolis in August 1911, under the call of Mr. Chapman.

The result of this meeting was a declaration of the principle that American bankers should give much attention to the agriculture of this country, not only because bankers are to a large extent personally interested in land, but because of the further fact that in the last analysis and from the larger point of view, farming, like banking, is a public business requiring far-sighted policies. Invitation was, therefore extended to every state bankers' association to appoint a committee on agriculture and vocational education. Mr. Chapman was elected president of the national organization. Up to date three such meetings have been held, and at the last one which met recently in Kansas City, Mr. Harris was made president. At that time the organization definitely declared an aggressive policy for a better and more permanent agriculture in the United States.

In the earlier stages of this movement it was assumed that the bankers themselves should not attempt to teach farming to farmers but rather that they should extend their good offices in helping the agricultural specialists to gain the ear of the farmer; but with time the movement has grown and has taken more the turn given to it at first by Mr. Harris, so that in the present stage of progress the bankers are to be regarded not so much as middlemen but as far-sighted business agents of the public, committed to the policy of giving their undivided support to those processes which will permanently advance American agriculture and its people and their opposition to the exploitation of worthless lands and to illegitimate agricultural activity in various forms.

The entrance of the bankers of the United States upon the field of agricultural progress is extremely significant. It means that a large body of able men not dependent upon the annual returns from the land but alive to the full meaning of agriculture has determined to give its attention to the question of the better utilization of American lands. This is a service which can be rendered by the bankers far better than by the farmers themselves, because the latter are dependent upon the regular and frequent returns from the land for the support of their families. Farming in its larger and public aspect is so nearly like banking that the financiers are trained and well prepared to pass judgment upon some of the principal phases of its development. The writer believes that the entrance of these people upon the ground will go far towards steadying progress and directing its energies along lines that will be permanently effective.

It is needless to say that an organization of this sort should keep disentangled from the smaller questions involved in farming and the interest of farmers. Bankers cannot afford to exhaust either their time or their energy on matters of this kind which are far better left to the farmers themselves; but upon the larger question of investment in fertility and permanent improvements, the bankers' opinions are valuable, and, again, it is well for any people when its agricultural and its financial interests are closely allied. Altogether it seems to the writer that this is one of the most important movements ever launched in any country and its ultimate meaning for American agriculture will be deeply significant.

In addition to the attitude which bankers have taken towards farming, they have adopted an educational policy. In this respect they have again taken solid ground. In common with others they have noted the deplorable lack of proper vocational training for the young, but, instead of following the lead of those of shorter vision and advocating the establishment of separate industrial schools, they have insisted that vocational courses should be added to the existing public school system, in this way rounding out the system and insuring a useful as well as a cultural education. It would be impossible for a body of men to take a definite action more far-reaching in its consequences than this organization has taken in respect to the permanency of American agriculture and the addition of vocational courses to the curriculum of the public schools.

THE INDIAN MATCH INDUSTRY.

BY PROF. P. G. SHAH, M.A., B.Sc., M.S.C.I., *Foreman Christian College, Lahore.*

Among the various changes in the social and domestic life of the people of India during the latter part of the nineteenth century, may be mentioned the increasing use of kerosene as an illuminant and of tobacco as a vicious luxury. These in turn have led to an increased use of matches which are now imported into India at the rate of over 80 lakhs of rupees per annum.

It is hoped that a study of the present position and near prospects of the manufacture of matches in India will prove both interesting and useful.

MATCH FACTORIES AT PRESENT.

The Match industry is an entirely new industry for India, and dates its growth from within the last twenty years. At present there are about fifteen match factories in India located at Bombay, Calcutta 3, Mysore, Ahmedabad 2, Bilaspur, Ellichpur, Kota, Poona, Sholapur, and Dharwar. All of these are not successful as they cannot command a regular supply of *cheap and good* wood suitable for match sticks.

SMALL FACTORIES.

" Most of these small factories make pyrotechnic matches by hand, obtaining matchsticks from Japan and tipping them locally, or even buying Japanese matches, breaking off their heads, and tipping the sticks with the pyrotechnic compound for firewood displays. The total quantity of the matches manufactured in India is estimated at 7 lakh gross of boxes per annum."*

IMPORTS.

It need not be mentioned that this output is insignificant when compared with the huge and expanding imports amounting to nearly 120 lakh gross of filled boxes. The following figures show a steady increase in the imports of matches.

Value of imports of matches into India in lakhs of Rupees.

1898-99	37·3	1907-08	73·1
1900-01	39·8	1908-09	74·5
1902-03	46·7	1909-10	81·5
1904-05	48·9	1910-11	83·9
1906-07	63·1	1911-12	87·5
		1912-13	98·3

These imports are mainly contributed by Japan and Sweden, each of which competes for the first place, and Austria and Belgium which also compete for the second place.

PROSPECTS.

The increasing imports may naturally cause some anxiety as to the prospects of the Indian match industry, but it is satisfactory to note the opinion of an authority like Mr. Troup that " India should be able to manufacture every match she needs " as she has plentiful supply of wood, and of cheap timber, and ready market.

Among the causes that have till now hindered the progress of this industry may be mentioned

CAUSES OF FAILURE.

(1) Wrong choice of factory sites ; (2) absence of expert advice and the consequent want of efficiency in the management ; (3) difficulty of obtaining sufficiently large supplies of wood of the same quality from a definite area ; (4) the high costs of the chemicals used ; (5) absence or high cost of means of transport for the raw materials ; (6) damp climate, specially in some of the large trade centres in some parts of the year ; (7) the comparative high cost* of railing the Indian matches to the market ; (8) cheapness of the imported article which leaves little margin for the profits of manufacture—the cost † of making the best

* " The Prospects of the Match Industry in the Indian Empire, etc.," by R. S. Troup Indian Forest Memoirs, Vol. II, Pt. 1, P. 2 : Calcutta 1910. This valuable monograph must be studied by all interested in the Indian match industry.

* Cp. also Troup. p. 21. " The rates for carrying matches on the Indian Railways are distinctly in favour of the imported article as concession rates are commonly allowed under certain conditions on the matches booked from seaport towns."

† Troup. p. 6.

match in India is estimated at about 10 annas per gross. while the average price of the imported article at the Indian ports is just the same. The common faults of the Indian matches, *viz.*, that the splints and the match boxes being not sufficiently dried before being packed become damp, mouldy, and discoloured, and that the head composition becomes soft in damp weather and refuses to ignite can be remedied under better technical and scientific advice. Similarly also, many of the other difficulties can be removed or minimised by the proper selection of sites with reference to raw materials and the proximity of the market, and by the use of better machinery under expert control. In the words of Mr. Troup, " India is herself capable of manufacturing every match she requires : there is a great future before the match industry of India, *provided the industry is developed on proper lines.*"

SUGGESTION FOR A SPLINT FACTORY.

With reference to the most important difficulty of the industry, *viz.*, the high cost of the raw material at the trade centres, it is suggested that it can be minimised by the putting up of the requisite machinery in the forests, where the splints may be manufactured for export to the factories. This will reduce the freight as well as the cost, while at the same time regularity of supply and uniformity of quality may be assured throughout the year. There cannot be any doubt as to the feasibility of the scheme, specially if we remember that the raw material for the paper industry is often manufactured in the distant forests and railed over long distances to the factories situated favourably near the markets. It is also to be borne in mind that even now it pays some manufacturers of matches in India to get splints from Japan or even from Europe and to prepare matches for local consumption. Thus a huge splint factory in some of the Himalayan forests should be able to supply the necessary raw materials to all the different factories less favourably situated, provided, of course, sufficient margin is left for the high railway freights.

THE NEW ACT AGAINST THE USE OF PHOSPHOROUS.

It is well known that the manufacture of safety matches is a matter of greater complexity and needs more technical advice than that of ordinary Lucifer matches. In this light, the Act passed recently by the Government of India prohibiting the manufacture of the latter matches might act as a temporary check on the output and work of the Indian factories. We may, however, hope that these factory-owners will wake up and, leaving the old conservative and 'rule of thumb' methods that have characterised Indian industries upto now, will be prepared to act up to the occasion in developing Indian Match Manufacture, and in checking the import of matches which now well nigh approaches a crore of rupees in value.

STATE HELP.

In conclusion, it might also be pointed out that there is considerable room for State Help, and State Protection in this Industry. As already pointed out, the Lucifer matches cost in India just the same as the foreign matches cost, *viz.*, about 10 annas per gross. The cost of manufacture of the safety matches will be a little higher and the competition will get keener, when the full effects of the new Act come into operation. If the State could see that the use of phosphorus was detrimental to the health of the operatives, should it not be expected also to vouchsafe the interests of the industry in the face of this keener competition? As British interests are not at stake, we can safely expect an increased duty on the imports of matches into India. Matches being imported only for burning kerosene or petroleum, and tobacco, it stands to reason that, if increased duties on these two commodities could be recommended, duties on the subsidiary commodities can be justified. Even if the justification is not ample, in the light of the evils of protection in abstract, help might be extended to the industry in a proper regulation of the railway freights for the raw material and the finished product, and in the plantation

of trees suitable for the industry at convenient and congenial spots. The principle of State protection in this direction has been already recognised in India and cannot bear the excuse of absence of precedence. For, it is well-known that the proceeds of a tax on the exports of tea from India are used for the furtherance of that industry.

CAUSES AFFECTING THE DECREASE AND INCREASE OF POPULATION.

BY J. E. VINEY, *Professor of Economics, Meerut College.*

The sources of this paper are extremely limited, and consist in the main of the Census Report of 1901 for the United Provinces, and of articles in magazines and standard works on the subject. I quote the Report fairly extensively, because my knowledge is practically confined to conditions in these Provinces, but at the same time, I think that the conditions here do not differ widely from those of other districts of India.

Seligman says in his Principles, "the density of population is conditioned by the character of the Economic resources and the degree of Economic development." Malthus, the famous originator of the doctrine of population, states abstractly that "Population, when unchecked, increases in a geometrical ratio." He supposes a state where all hindrances to the growth of population are removed, and believes, in such a state, that there will be a definite increase in geometrical proportion. Mill agrees with Malthus in his doctrine.

It is acknowledged, therefore, that population, if unchecked, would increase to a much greater extent than it does, checked as it is, by so many influences. Many attempts have been made to prove the validity of Malthus' theory, but none have been conclusive, for the simple reason that there never has occurred as yet the ideal state of things on which he bases his conclusions. One might prognosticate that, as the various hindrances to the growth of peoples are ameliorated, or removed, such increase might approximate more nearly to a Geometrical Progression. It must not be forgotten that the growth of population depends normally on the fertility of marriages, and by removing hindrances to the desire to create, the ideal of Malthus might be brought appreciably nearer. However, I do not propose to discuss this question here, but to confine myself rather to the discussion of the causes affecting peoples, more especially in this country.

What, then, are the influences determining pressure of population in this country?

At the outset we are faced with the difficulty of enumerating all the various conditions, because many of these are peculiar to various countries and localities. Nevertheless, we can go on the broad basis of placing the causes under the two heads, (1) Economic, (2) Social. This latter, again, may be divided under the headings of Religious, Moral and Legal.

I shall try, first of all, to treat of population as determined by purely Economic causes and uninfluenced by Social reasons.

In contrasting the population per square mile as a result of the world's census of 1901, we find a remarkable fact in that India, with a population of 167 per square mile, is almost equal to Austria, with a population of 188 per square mile. Austria is a highly commercial country with a moderate amount of agriculture proportionately, whilst India is the reverse—a small amount of commerce as contrasted with a highly intensive agriculture. We can deduce, therefore, (though the deduction is open to criticism) that the Economic occupations do not entirely affect the amount o population in a country. But, on the other hand, local conditions do affect very seriously the number of persons.

One of the chief causes—and I would call

it a local cause, as being peculiar to countries like India—affecting population in this country is the effect of the rainfall. A failure or an excess acts adversely to the increase.

It is a necessity to the success of the crops to have heavy rain in the monsoon months of July, August and September, and a few inches in December and January. If the rains are late, the preparation of the ground for seed is put back, whilst heavy rains as a consequence in September damage the young crops. Excessive winter rains may also affect seriously the spring crops.

Taking the Decade, 1890-91 to 1900-01, in the United Provinces, we find many results of this. The heavy rains in the winter of 1892-3 caused the rotting of the young spring crops in the Bandelkhand District: an excess of 5 inches over the normal in the monsoon of 1893 again injured the crops: in 1894—95, there were similar excesses of rain, which in the latter year produced a virulent form of malaria. The general effect of these excesses was to render a population of over 30 millions, almost entirely dependent on outside supplies of food. Further effects were noted in that the crops in the districts concerned were only 65 per cent. of the normal, which resulted in the famines of 1896-97, and opening of relief works. The rest of the decade was fairly normal. The effects of these climatic changes can be best judged by the exports of grain from the Provinces, which vary enormously according to the amount employed in consumption within the affected districts. The rate of variation is extraordinary, being as low as 12 lakhs of maunds in 1896-97—the years of famine conditions—and as high as 91 lakhs in 1898—a year of normal rainfall.

Scarcity in the necessities of life naturally results in an impoverished and enfeebled people, with deaths from starvation as an outcome, and this may be taken as one of the retardations to the growth of population.

The effects of disease on the people are especially noticeable in the United Provinces, although the Statistics cannot be taken as being entirely accurate, owing to the difficulty of collection. The resultant number of deaths from disease is remarkable. The important fact to be noticed is that the amount of disease is directly connected with the climatic conditions, any abnormality in which means a consequent increase in illnesses in one form or another. The total number of deaths directly traced to cholera was over 800,000 in the decade, whilst over 12,000,000 individuals died from fevers of various sorts, malaria accounting for the greatest number. The annual number of deaths was found to be in excess of the normal in the years 1894, 1896, and 1899—the years of excessive rainfall, and in 1897—due to the effects of scarcity on the people.

These then are the economic effects on the population of climatic conditions alone. Rainfall below the normal produces scarcity, and, very often, cholera: above the normal, it gives rise to scarcity again, and fevers result. Decimation of population results in either case. After excessive years of disease, a low birth-rate is noticeable, due to the impaired vitality of the people. After years of scarcity, much the same result follows.

The effects of varying climatic conditions are felt in these provinces, not by one class only, but by all. The oft-repeated statement that India is dependent on agriculture alone, is more true for North India than for any other part of the Peninsula. Conditions in the years above the ordinary affect the population of the United Provinces, as a whole, since nearly all are dependent on one industry, which is itself dependent on the vagaries of the weather. The influences on the increase or decrease of the population, therefore, are hardly counterbalanced by other influences, which may be apparent in other districts, where the dependence is not on one occupation alone. The manufacturing towns in the United Provinces are few in number, and dependent chiefly on the raw material of the districts round for their livelihood, and depression, accordingly, in purely agricultural districts is almost equally felt in urban areas.

Apart from the causes mentioned above influencing the variations in population, we

have to consider the results of three other special influences, *viz.*, migration between districts, or between country districts and urban areas, immigration into the Provinces themselves, and emigration from India, all of which affect numbers to a certain extent. Immigration into India itself may be neglected, as it is negligible in its influence in any Province, especially of Northern India.

The growth of towns is becoming more and more due to the fluctuations of trade, though I shall try to show later that the influence of social, religious, and political reasons is even yet not inconsiderable. The presence of a railway, and the improved means of communication afforded by it, tends to draw to a town increased trade, and a consequent increase in population. The town of Mirzapur, on the other hand, shows that railways may sometimes do harm to a centre of trade. Mirzapur was a centre of trade for he Ganges Ghogra-Doab districts at one time, but a few years after the extension of the Bengal North-Western Railway, was depopulated to the extent of over 11 per cent. On the other hand, such towns as Cawnpur and Lucknow have all gained since the introduction of the railways.

Coming to the question of immigration into the Provinces, we are confronted with the interesting social fact that a man tends to take as a bride a woman from another town or village to the one he lives in, and that the usual practice in such cases is to take the brides from the East. To what extent this East to West movement goes on, it is impossible to judge, but it is probable that a fair proportion of the immigrants is due to this fact. Immigration to the extent noticeable in in Bengal and Assam, where it is due very largely to the plantations there, is comparatively negligible in the United Provinces, owing to the fact that such industrial concerns are few.

Migration between country districts and urban areas goes on yearly, and is due to the presence of manufactures in the towns. It is especially noticeable in years of distress in agricultural parts, when the cultivators to a certain extent change their mode of occupation to tide over the bad period. Migration in normal years may be put down chiefly to the expansion of manufactures, and the increase in the ranks of the small traders.

Migration between district and district, again, is noticeable in times of stress, and may be due to two causes. Scarcity in one district leads to the movement of the people to other districts, where the necessities of life are more plentiful. However, this is not so frequent as it was, owing to the efficiency of relief measures undertaken by Government. Migration occurs, also, when one district is depopulated for some reason or other, and people flow in to fill the deficiency. The Bijnor District is one of those to which the above applies.

Emigration from India to Fiji, Natal, etc., affects the United Provinces very considerably, but the statistics are not wholly trustworthy. However, loss from this cause accounted for over 100,000 in the decade 1890-1900.

My information as to the second part of the subject, *viz.*, the influence of social, religious, and political causes on the growth of population, is very meagre.

Certain towns owe their growth to political reasons, *viz.*, Cawnpur and Hathras. Agra, again, is an example of a town of this class, its size being in part due to the fact that Akbar constituted it a seat of Government. Delhi is the latest example, and the population here has increased since the movement of Government.

The populations of such cities as Benares and Muttra increase temporarily during times of religious festivals, and permanently through the settlement of people there for religious purposes.

I have already mentioned a social influence in the East-to-West marriage movement.

The Economic causes, therefore, affect the growth of population more considerably than any other influences. The methods by which Governments and Societies are combatting the hindrances to the growth counteract against the harmful effects of these causes, and as I suggested above, we may eventually approach Malthus' ideal state. The above is simply an attempt to deal shortly with the subject, and I should be glad of criticisms and information on the points raised.

The Agricultural World.

Needs of the Soil.

The following is an excerpt from "Agricultural Notes" in a recent issue of the Melbourne *Leader*. "To ascertain the needs of a soil for plant food is not a simple matter. Chemical analysis, while it supplies useful information, is not in itself a certain guide, Plot experiments are not reliable.

The best method of ascertaining the need of a soil for plant food is- by means of field tests. Strips of land throughout the field from one end to the other are treated. These are treated alike in all respects, excepting that they receive different fertilisers. The yield of the crop can then be taken as a measure of the effect of the various applications."

How to Grow Cucumbers.

A recent issue of the *Queensland Agricultural Journal* contains the following :—The cucumber is not very particular as to soil, so that it be light, rich and loamy ; it may be nearly all sand, provided that good rich manure be added, and that it be deeply dug. The cucumber bed should be sheltered from the westerly winds. The pits, or as some call them hills, should be made ready in August in the following manner :—

Mark off the land in 6 ft. squares and at each intersection make a hole 2 ft. in diameter. If the soil be not naturally rich, mix with it a compost made up of well-rotted stable manure, sheep or poultry dung, wood-ashes, bone-dust (if procurable) and a little salt. Fill up the hole with this prepared soil and sow five or six seeds in it in a ring. Half-an-inch is deep enough for the seeds. When they are up, take out all but two plants in each hill. Stop all lateral runners as soon as they show fruit, and the secondary runners must be pinched back to the fruit in the same manner. If the weather is dry, give the beds a good soaking with diluted liquid manure about once a week. Water every evening sufficiently to damp the soil right down to the roots.

Make successive sowing during September, October, and November. To produce straight cucumbers place under them three-sided boxes 3 in. wide, the open side uppermost.

A very good way of watering cucumbers to ensure the water reaching the roots is, as soon as they show signs of running, to dig a hole large enough to hold a quart can as near the roots as possible. Make holes in the bottom of the can and place it in the hole near the roots of the plant. Put the cans in the ground about 2 in. deep and fill them with water every other day.

Cucumbers are ready for market in from 75 to 105 days.

Kapok.

Bulletin No. 26 of the Bureau of Agriculture, Philippine Islands, deals with the Kapok Industry.

The tree *Eriodendron anfractuosum* is widely distributed in the tropics. It has many near relations including Bombax, but all yield an inferior floss to that of the kapok.

Java was one of the first countries to take up the cultivation and export seriously, but the Philippines have now followed suit. The main use of the floss, which is very elastic, is for stuffing cushions and upholstery.

The author states that the trees should be propagated from cuttings from trees yielding the largest quantity of big pods containing floss of the best quality and colour. Trees grown from cuttings yield a crop 6-12 months earlier than those raised from seed. The first crop may be expected in the third year from planting.

If raised from seed only, selected seed from good big pods with a thin husk should be used, and planted in a nursery 15 centimetres

apart. The seedlings should be ready for planting out in 12 months' time.

The climate best suited to the kapok tree is a warm one and a mean elevation of 500-1000 metres. Nor does it require a large amount or even distribution of rainfall and it can withstand a drought. It is most essential that there should be little or no rain from the time of flowering until after the pods are harvested or the quality of the floss will be inferior. This period takes about five months.

The tree being very brittle does not like strong winds, and cyclones are fatal to it.

The soil it prefers is of a volcanic substance, but it does well also in alluvial and sandy soils.

The trees should be planted $6 \times 6\frac{1}{2}$ metres and require very little cultivation.

The pods should be harvested directly they show signs of ripening by turning brown, or they will open and much floss be lost. The trees being too brittle to climb, long cocoa-pickers must be used. The pods should be graded and then opened as soon as possible after picking.

The author describes several methods of hand-cleaning for the benefit of the small cultivator, but there are three kinds of machines now invented for cleaning the floss expeditiously and well. The floss is then ready for baling in much the same way as cotton is baled and shipped. Holland is the largest consumer at present as all the best kapok comes from Java. Silk cotton has been exported from India and Ceylon but being the produce of Bombax the floss is of poor quality.

A hectare planted in kapok containing 280 trees should yield about 450 kilos in the fifth year and 650 in the ninth.

In 1912 the price was 90 centavos per kilo and the price tends to advance owing to increased demand as further uses are found for it.

One of its chief uses is for filling life-saving appliances, but this of course has only a very limited market ; a wider market is that for the stuffing for upholstery for which it is particucularly adaptable.

But the real commercial value of the floss will be recognised when the spinning of it becomes perfected and both new machinery and new processes of treating the raw material are being exploited. It is said a yarn of very fine, soft, silky quality can be obtained from it when treated by a process still kept a secret.

From the seeds oil of a fairly good quality is obtainable and the residue can be used as a cattle-cake.

The tree seems to suffer from very few known diseases—a cotton stainer in the pods and Helopeltis being the most serious.

A Cotton Picking-Machine.

There has been a lot of talk from time to time about an efficient machine to pick cotton, but they seem to have evolved one at last, of course, in America. A couple of such machines have been recently tried in Texas on black soil, of something of the sort we have in the great cotton belt in India, and picked nearly five pounds of cotton per minute each. When compared, the cotton thus picked made a better showing than that picked by hand. Only one man is required to operate a machine, which can pick an acre an hour, or at least eight acres a day, and the rows so picked are said to compare very favourably with rows picked by hand. In case a rapid picker is required for India, *Capital* says, this Price-Campbell machine may claim attention.

Calves from Tuberculous Cows.

Is bovine tuberculosis heriditary ? Dr. Vœlcker's experiments would seem to show it is not. Calves were separated from the parents, and not permitted to have the milk in the natural way. It was found that if the calves got over the first day, they gave no further trouble. Fifteen were reared under healthy surroundings, with every precaution taken to ensure absolute isolation from other stock, and a man especially to look after them. They were first fed on sterilised milk and later, on sterilised gruel. The steers were all fattened off, and slaughtered last May at Islington Market. The carcases were there carefully examined by experts, and not the slightest trace of tuberculosis

was discovered. Accordingly, remarks Dr. Vœlcker, they might draw the satisfactory conclusion that animals, though born of tuberculous parents, if kept isolated and under healthy surroundings, need not themselves be tuberculous. The heifers are being bred from, and the calves will be kept for a month, when the parents and offspring will be slaughtered together, and the carcases examined as before. The completed results of the experiments, which it is estimated have cost about £800, will shortly be available. It may be here mentioned that everyone was deceived with the appearance of the tuberculous cows, which looked all that could be desired. That is the point.

Expert Assistance in Agriculture.

Some useful information was afforded by Mr. Evans, the Deputy Director of Agriculture in the Central Provinces, as to the directions in which expert assistance would be found indispensable in the improvement of agriculture. In a paper read before the Central Provinces co-operative conference, he showed the various stages of development which must occur in the introduction of an improved variety of seed. The expert, he said, must proceed from the single selected ear of wheat, for instance, to the small experimental plot and then from the experimental plot to a larger one, and so on, until he had sufficient pure seed tc sow a seed farm with. The time required for these preliminary processes was about seven years. Then again, said Mr. Evans, it was not generally understood that one variety of wheat would be found especially suitable to certain soils and positions ; and cultivators were frequently in the habit of sowing unsuitable varieties. In this direction, the expert could be of very valuable assistance. Special implements too such as the monsoon plough had been devised to suit local conditions. Central Banks, he thought, could always obtain good advice from experts but must not look to experts for too much detailed supervision. In his opinion, it was the business of Central Banks and Societies to provide the staff necessary for their own work.

Sewage as a Manure.

Dr. J. Grossmann in discussing "The Utilisation of Sewage in Agriculture" before the British Association Agriculture Section, said the total value of the nitrogenous matter, phosphates, and potash compounds contained in the liquid part of sewage was equal to twenty million pounds per annum. The value of its solid matter, termed sewage sludge was about million pounds per annum, and he had succeeded in designing a practicable method by which this amount could be made available. By his process the dried sludge was mixed with a small percentage of acid and subjected to the action of superheated steam, which carried off the fatty matters (which were condensed in water) and left an inodorous, brown powder, completely sterilised, which contained, on an average, 1·5 per cent. of nitrogen, 3 per cent. of phosphate of lime, and ·5 per cent. of potash, distributed in almost molecular state over from 30 to 40 per cent. of organic matter similar to humus, and mixed with a certain amount of carbon in an extremely fine state of division. The process did not add to the cost of sludge disposal, was automatic, and worked day and night without a break.

The Stimulation of Plant Growth.

The question has been raised, as to the extent to which manures may simply stimulate the growth of plants ; that is to say it has been asked if manures are capable of causing changes to take place in plants, which result in increased growth, without necessarily acting as providers of food.

Investigations undertaken recently give an answer in the affirmative.

It is well known, writes the *Agricultural News*, that, while ammoniacal manures, including pen manure, form some of the best manures when they are employed carefully, their use in large quantities or in a concentrated form, as for horticultural purposes, may actually kill the plants that they are intended to benefit. This is quite in accordance with what should be the effect of ammonia if it acts as a hormone, for the stimulating action of these bodies is

only exerted when they are present in an amount below a low maximum—above this maximum they are poisonous. Further, an explanation is indicated of one of the reasons for using well-rotted pen manure in preference to the fresh dung. In the latter, the early changes due to putrefaction cause the ammonia to be liberated so quickly that it is harmful.

Some explanation of the beneficial effects on plant growth by the partial sterilization of the soil has been sought in the supposition that the process results in the production of hormones such as ammonia which subsequently exert their stimulating action on the plants raised in the soil ; a similar explanation is adduced for the better germination shown by seeds sown in partly sterilized soil. In either case if the soil is sterilized by heating it very strongly, growth is made slower, and germination retarded, at first, suggesting that the hormones are present in poisonous proportions after the treatment, and that these proportions decrease gradually to those in which the action is stimulating.

We may point out that the term hormone is applied to all substances that can penetrate the membranes which are said to cover the leaves of a plant and which are technically known as 'differential septa.' The theory has been put forth that such substances exercise their disturbing influence, in the cells into which they have penetrated, by permitting the enzymes already present to become active.

Agricultural Development in Mysore.

Dr. Coleman, Director of Agriculture, Mysore, in the course of a lecture delivered recently at Bangalore, on the above subject, mentioned that two extreme views are held with regard to the possibilities of agricultural improvement in India. One view is that the Indian cultivator has evolved through long processes of time the methods that are best suited to the needs and conditions of the country, and that no change is necessary ; the other apparently being that there should be a thorough overhauling of these time-honoured methods.

" As is usually the case with extreme views" says Dr. Coleman, " both of these are far wide of the mark." If we consider especially the conditions as we find them in Mysore there is undoubtedly much in the present methods of agriculture which must excite the highest admiration. The way in which excellent results are frequently obtained by means of simple and inexpensive implements and apparently primitive methods, must leave behind the impression that experience through long centuries has been an admirable if stern teacher.

Dr. Coleman speaks of three main lines upon which permanent improvements in agricuture should be made. The first of these consists in the introduction of improved cultivation and other implements which will produce better results in less time. The second consists in the introduction of improved method of cultivation and manuring ; and the third consists in the improvement of the varieties of the existing staple crops and the testing of imported ones as to their suitability for Mysore conditions.

The lecturer had a spirited appeal to make towards the close of his speech which we hope will go home to the hearts of all agriculturists. He said :—To such of you as are here tonight I would say, you have no right to look upon your land as your property in the same sense as the coat you wear or the house you live in ; your land is yours in trust for future generations, and upon the way you handle that trust depends to a great extent the future agricultural prosperity of the country. You have no right by ignorance or indifference to allow it to be drained of its fertility or to decrease in its crop-producing power, so that it will be handed on to the next generation in a poorer condition than that in which you received it. Rather, if your expressed solicitude for the advancement of your country in material prosperity is more than mere lip service, you will see to it that your land increases in fertility and productivity from year to ye so that when you pass it on, it will remain an indelible record of your good stewardship.

It seemed to the lecturer that the hope of

the future lay in the development of Rural Co-operative Societies which enforced on the members a certain amount of practical combined effort. In addition to Co-operative Societies, there should be Agricultural Associations, organized for the express purpose of furthering agricultural improvements; and their usefulness would depend upon the number of practical farmers and landholders that are active members therein.

Small Holdings.

The July issue of the *Journal of the Board of Agriculture* contains an account on small Holdings in Sweden from the Report of the Departmental Committee on Buildings for Small Holdings of which the following is an extract :—

INSTRUCTION AND ASSISTANCE FOR SMALL-HOLDERS.

It is usually recognised in Sweden that the placing of men on the land is but the first step, and that it is of great importance that they should receive instruction and guidance in the subsequent management of their holdings. The measures taken by the State to supply this need, of course, are not limited to those occupiers who are assisted to obtain land by means of State funds, but are part of a scheme for encouraging improved methods in the cultivation of small holdings generally. A very important part in the administration of the laws affecting agriculture is played by the agricultural societies ; most of these have been in existence for about a century, and one is generally to be found in each county. Since 1902 a number of laws have been enacted with the view of improving the cultivation of small holdings ; some of the more important of the measures adopted are as follows :—

AWARD OF PRIZES TO SMALL-HOLDERS.

Each agricultural society divides its district into two or three " Rewards " districts, and awards prizes every few years for the best kept and most productive small holding. Tenants of holdings not exceeding 30 acres are eligible for these prizes.

TOURS OF INSTRUCTION FOR SMALL-HOLDERS.

Men and women occupying holdings not exceeding 100 acres can take part in these tours, which are found to be conducive to improvement in the cultivation of small farms. Travelling expenses are paid by the State, and other expenses by the agricultural societies, the itinerants sometimes contributing a small sum themselves.

INSTRUCTION AND PRACTICAL TUITION.

The people's high school, which have been in existence for nearly fifty years, provide educational facilities for farmers' children giving agricultural instruction of a general character ; and closely connected with them are the agricultural schools proper. Purely agricultural tuition for small farmers is provided by means of local courses lasting six or fourteen days. A new and similar type of agricultural school is now being established, which is intended primarily for the sons of small farmers, those who have only passed through the elementary schools being eligible pupils.

There are five State consulting advisers and inspectors in agriculture, one of whom devotes his whole time to small holdings. Their duty is to supervise and instruct the numerous provincial agricultural experts (agronomes), who advise small holders throughout the country ; to advise generally as to any measures that will improve and develop agriculture, and to promote the creation of associations of all kinds.

In some districts trial has been made of a system of itinerant foremen, who are given much smaller districts (comprising only one or two parishes) than those assigned to the local agricultural advisers. These foremen advise the small farmers in regard to the practical working of their farm ; they are the servants of the provincial agricultural societies, but the State gives a grant-in-aid, and provides course of instruction for their training.

THE IMPROVEMENT OF FARMERS' HOMES.

Courses of lessons in cookery and domestic economy are provided, and tours of instruction

for women also constitute a feature of his work. Advisers in household management have been appointed in some districts, and it seems probable that this movement will be considerably developed. Two country homesteads have been fitted up to serve as demonstration centres for the whole range of domestic work.

ENCOURAGEMENT OF ASSOCIATIONS.

Much importance is attached to the organisation of agricultural associations of all types, and especially to those intended for the benefit of small farmers, such as milk-control, bull, book-keeping societies, etc. The State aids in this work by providing instruction as well as by giving considerable financial assistance.

Indian Market for Farm Appliances.

The trade emissary of the United States sent out to India to report on the scope and possibility of introducing modern farming implements to the Indian agriculturist has made known his views in a valuable official report from America.

He pays a well deserved tribute to the work of the agricultural departments in India in stimulating an interest in modern methods and appliances among the Indian agriculturists. Referring to the farm-implement depots, which are recognised to be "doing a most useful work," he explains:—

"At these Government depots it is the practice to make a study of implements most suitable to local conditions, to import or manufacture them for sale to farmers and, after they are sold, continually to guide and instruct the farmers in their proper use. There is no doubt that the operations of these depots have assisted greatly to increase importations into India of up-to-date agricultural machinery and appliance, and that through their campaign of education they have opened up and successfully prepared the way for extensive business in the sale of such articles in large sections of the Empire where previously no business of such sort was possible."

The official intention, however, is not to monopolise the trade in modern farm implements, but to attract private enterprise by creating a market first and then eventually handing over the trade to private concerns.

He then goes on to review the work done by these Government implement depots in the several provinces and we reproduce his remarks below:—

THE PUNJAB.

The Agricultural Department in the Punjab receives from the Government a permanent advance for introducing agricultural implements to cultivators. The implements chiefly introduced are ploughs, chaff-cutters, winnowers, bullock hoes, and reapers. No threshing machines have so far been purchased. Private firms have now undertaken some of the work.

THE CENTRAL PROVINCES.

In the Central Provinces, so far no private firm has appeared to assist the department. It has depots at Nagpur, Raipur, Hoshangabad, and on a small scale at Akola. The department stocks winnowers, ploughs, chain pumps, sugar-cane mills, maize shellers, and bullock gears. Chaff-cutters also are stocked, but as yet there has been little demand for them. Small iron sugar-cane mills are, however, in some demand.

THE UNITED PROVINCES.

In the United Provinces, the Agricultural Department has a permanent advance of $9,334 (say Rs. 30,000) for seed and implements. Over $8,334 (say Rs. 25,000) is devoted to the purchase, holding, and distribution of implements. Some are made wholly or in part in India. There are depots at Cawnpore and Partabgarh. Demonstrations are held at local fairs and are announced in advance by the authority arranging the fair. Special demonstrations are also arranged at the request of the zemindars. The principal implements sold by the department are low-lift chain pumps, ploughs, chaff-cutters, grain-crushers, harrows, and cultivators. Reapers and winnowers, which have been hitherto stocked by the department at Cawnpore, are now supplied by a private firm, but little business has been done so far.

EASTERN BENGAL AND ASSAM.

Very little has so far been done in Eastern Bengal and Assam in the way of supplying improved agricultural implements. There is no permanent advance for this purpose, and no co-operative society has yet been formed with this object in view. A European firm in Kushtia manufacture sugar mills and shallow boiling pans which they hire out to sugar-cane growers. They have established depots all over the Rajashahi division and parts of the Dacca division, from which the mills and pans are let out to cultivators.

BOMBAY PRESIDENCY.

There are three agencies for the demonstration and distribution of implements in the Bombay Presidency: (1) the Agricultural Department, (2) private firms, (3) the more advanced agricultural associations. The department co-operates with the two latter. The department takes charge of machines belonging to firms and sells them without making any charge for agency. No liability is accepted by the department for the state of implements in their charge. The department is at present prepared to act as sub-agent for any firm that cares to enter into business. The chief descriptions of implements distributed are ploughs, chain pumps, chaff-cutters, and iron caue mills. In Sind there is a workshop at Mirpurkhas making ploughs, threshing machines (Egyptain pattern), water-lifting apparatus, and levelling scrapers.

BENGAL.

In Bengal there is one central depot for seed and manures. Orders were formerly executed by this depot, but at present they are too numerous to be dealt with departmentally. A firm in Calcutta has undertaken the manufacture of ploughs, which form the mainstay of the business.

THE MADRAS PRESIDENCY.

Work in the Madras Presidency has been wholly confined to supplying implements of local manufacture. The method can be summed up in a few words. Lend implements free, give advice and instruction free, teach ryots how to handle these implements until they realize that it pays them to use them. The loan of implements can then be withdrawn, and if it really is to the ryot's advantage he will arrange to supply himself with what is required, either buying from the agricultural station or getting the local blacksmith and carpenter to make.

In a supplementary report the agent refers to the growth of the co-operative credit movement. In his opinion suitable conditions exist in India for the use of wind-mills along the sea-coast from Karachi to Bombay and from Diamond Harbour to Negapatam, over a large tract of the Deccan, over the Mysore plateau, and probably in most of the hill stations.

Farm Management in the United States.

Mr. W. J. Spillman of the Office of Farm Management, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, writes in the *Monthly Bulletin of Agricultural Intelligence.*

Farm management is that branch of agricultural science which deals with the business problems connected with farming. It is, in reality, a branch of applied economics. It may be logically divided into the following subdivisions :—

1. A comparison of farming with other businesses as a means of earning a livelihood, including the advantages and disadvantages of the farm as a place of living compared with the city.

2. Preparation and training required for success in farming.

3. The method of securing a footing on the land.

4. The selection of the region in which to engage in the business of farming.

5. Principles involved in choosing the individual farm within the region selected.

6. The selection of the enterprises (crops, live stock, etc.), which are to constitute the basis of the farm business.

7. Farm organization. This branch of the subject deals with the principles involved in fitting together suitable enterprises in such a

way as to give the most desirable distribution of labour throughout the season, to secure minimum expense in equipment and management, to secure the maximum use of equipment and to provide employment for the capital available.

8. The character, quality and cost of equipment required for the proper conduct of the organized farm.

9. The capital required and its distribution between the factors of production on the farm.

10. Farm operation. The subjects which are dealt with in this branch of farm management are systems of operations, such as operation by the proprietor and his family, operation by hired labor, managerial operation by tenants, either cash or share. Another phase of farm operation which is an important subject in farm management is the character of the lease contract between landlord and tenant when the farm is operated on a tenant system. The principal phase of this subject, from the standpoint of farm management, is the division of the profits of the farm between labour and capital. The study of farm operation also includes the subject of farm records and accounts; the management of farm labour; the care and keep of equipment; the principles of marketing, etc.

Teaching Farm Management.—Of the forty-eight State agricultural colleges in the United States thirty-eight are now teaching the subject of farm management, and one other states, in reply to a circular letter, that the teaching of this subject will begin next year. Thirty-six of these institutions report a total of 2,575 pupils in their farm management classes. One other states that the subject is taught to all seniors, and another states that it is taught to all students in the institution.

When it is considered that the teaching of farm management as a separate branch of agricultural science is comparatively new in this country, there being only two institutions in which classes were held in this subject six years ago, it is seen that farm management is rapidly making its way into the agricultural schools of the country.

Farm Management Investigations.—The United States Department of Agriculture is mainly an investigating institution. There is also in each of the forty-eight States of this country a State agricultural experiment station supported partly by funds from the national government and partly by State appropriations.

Following is a list of the more important subjects of investigation relating to farm management reported on by the various State experiment stations: supervision of farms; records of labor and financial transactions on farms; farm management surveys (see below); cost of operation; cost of producing corn and wheat, investigations of capital and equipment on home farms of students; the economics of dairy farming; farm home management; the economics of stock management; economic surveys of a State; price paid by farmers for produce and paid by consumers in various towns in a State; influence of absentee landlord upon crop rotations, methods of management, and types of farming; management of surplus farm help in winter; use of farm teams to best advantage, systems of accounting; distribution of labor on various crops; comparative cost of production under humid conditions and under dry farming conditions; most profitable rotation systems adapted to different sections; relation of type of farming to profit; economic study of the retail milk business; marketing of farm products; marketing of cheese; land tenure; history of agricultural production; proper amount of farming on a given area of land.

The farm management surveys, which are becoming one of the most important phases of farm management investigations in this country, need some elucidation. In this work groups of not less than six hundred farms are studied in sufficient detail to determine the labor income of the farmer. In these studies the gross income and the total expense of each farm are determined. The labor income is then calculated by deducting from the net income of the farm interest on the capital invested and the value of unpaid labour performed by the members of the farmer's family. What is left is considered to be the labor income of the farmer himself.

One result of these studies has been to indicate that on an average the income of the farmer is sufficient to maintain the farm and its equipment, pay interest on the investment, and ordinary wages to the farmer. It is thus seen that farming compares favourably with other industries in which there is free competition and in which production is limited only by demand.

It has been found that the labor income increases or decreases with the size of the farm.

The Co-operative World

Co-operation in Mysore.

Two Co-operative Unions were started during the year 1912-13, one at Hassan and the other at Tumkur. These Unions consist of about ten societies which have banded together to form a federal Union undertaking and organizing supervisory and financial functions. The Unions are still in an infant stage and have not seriously commenced work.

Co-operative Shipping.

Some years ago, says "*Successful Farming*," farmers in the more progressive districts of Minnesota, dissatisfied with the conditions imposed upon them by private dealers, led the way in the formation of co-operative associations for shipping live stock. These appear to have met with pronounced success, since the movement extended almost immediately to Wisconsin and Iowa, and the number of associations have increased rapidly. Till 1911, live stock was being shipped by associations from three points only in Minnesota, Lichfield, Springfield, and Buffalo. Since that time, thirty-seven new local associations have been formed, others are in process of formation, and a State central association has been organised intended to promote the extension of the movement and develop a uniform system of accounting.

Need for and Uses of Co-operation.

The following is a summary of a paper on *The needs for and the uses of Co-operative Societies*, read before the Mysore Economic Conference during its last session at Bangalore.

If we consider the state of credit in our country, nothing strikes us more than the hoards of unused capital stored up in the Presidency Banks on the one side and on the other, the utter paralysis of industry in rural India due to the poverty of the classes engaged in the production of wealth. Rs. 1,50,00,000 are locked up in the Post Office Savings Bank. The average for 10 years of gold imports has been Rs. 4,00,00,000 and of silver 210 millions of rupees, and the latter chiefly coined into rupees, and the former chiefly absorbed in ornaments. Meanwhile, the cultivating and artisan classes get no loans except at rates of interest ranging from 12 to 24 per cent.

If there were no capital in the country, seeking investment, there would be reason to despair. There is capital ready to hand, only it is awaiting secure investment. "The gulf between the saving few and the producing many has to be bridged." In other words credit has to be organised. This organisation of credit has taken the form of co-operative credit ocieties. "There is no more certain incident of the progressive change taking place in society than the continued growth of the principle and practice of co-operation."

There are two ways in which the co-operative movement operates to the benefit of the public. (1) It reduces the class of mere distributors who are not producers. (2) It operates to the benefit of society by placing the labourers in a position in which they will do their utmost in exchange for their remuneration.

The Co-operative Movement.

Thakur Thamman Singh, Assistant Registrar of Co-operative Societies, said in the course of his speech on the co-operative movement at the Fyzabad Industrial Conference that its growth in the United Provinces had been satisfactory. In fact, it has been too rapid when compared with European countries. The reasons for this may be—

(1) There was great need for organised credit.

(2) The cultivators could not obtain capital on the same terms from elsewhere.

(3) The movement was patronised by the Government.

But too rapid growth is dangerous if neces-

sary safeguards are not provided. In this case they are these—

(*a*) The members must understand the co-operative principles and practice.

(*b*) There must be an absolutely reliable agency for seeing that the financial part of the movement is carried on on perfectly sound lines.

The Government department has been doing this with the aid of honorary workers and paid staff, but its hands are now too full. There are necessarily limits to Government aid, although the Government is giving all reasonable help. Where honorary workers have been found the movement has gone on successfully, but where such aid is not forthcoming the movement has not been able to take root, *e.g.*, Saharanpur and neighbouring districts It is not right to think that the registrar is responsible for opening new societies. His work is to guide the movement on right lines It is, therefore, absolutely necessary that a local agency must be found when this movement is to be pushed on. In the absence of honorary workers a paid staff must be kept but in the beginning sufficient money cannot be found to employ the proper type of men. It is not wise to keep low-paid men with great financial responsibilities. Therefore, the best course is to enlist the sympathies of gentlemen of influence who may be willing to work honorarily. Arrangements can always be made to give elementary training to such gentlemen by the Registrar.

The assistance given by the gentlemen of the legal profession, the zamindars and big money-lenders has been acknowledged from time to time in the provincial reports.

It is not right to think that all money-lenders are opposed to the movement or that the movement aims at ruining money-lenders. As has already been said, big money-lenders have given financial help and some petty ones have also made deposits in one or two societies. The co-operative movement aims at the amelioration of the condition of the poorer classes by raising their credit and thereby placing money-lending on organised lines.

Simla Co-operative Conference.

The Seventh Conference of the Registrars of Co-operative Societies was held in Simla on the 16th, 17th and 18th of October 1913. The Hon. Sir Robert Carlyle, Member of Council in the Department of Revenue and Agriculture, attended the commencement of the conference for the purpose of meeting the members and the conference then proceeded to discuss the general progress made in the several provinces. Papers were read and discussed regarding the practical difficulties in the management of rural societies, the safe custody of money by village societies, the grant of Government takavi loans to members of co-operative societies, the best method of dealing with the old debt of members of co-operative societies, the question of future interest decreed by the civil courts in suits instituted by co-operative societies, and the necessity for a simple procedure for ascertaining the debts of members or prospective members of co-operative societies.

On the afternoon of the same day, two sub-committees met under the presidency of Messrs. English and Langley respectively, for the purpose of discussing certain further questions. One of these sub-committees dealt with "the best method of calculating working capital, the desirability of framing rules for the supply to the public of certified copies of public documents relating to co-operative societies, the limitation of loans to members in share banks to a certain multiple of their shares and the form in which the report of provincial co-operative conferences should be drawn up."

The other sub-committee dealt with the proposals for defining and standardizing certain terms commonly used in co-operative societies, the remittance of money between societies and the method of showing the reserve fund in the annual returns.

On the 17th October, the reports of the sub-committees were considered by the Conference and necessary resolutions were passed.

The conference then proceeded to discuss a paper on "Co-operative banks and popular education," after which the question of cattle insurance was taken up and certain proposals

were discussed regarding the grant of Government assistance to cattle insurance societies. A paper was also read on the organization of co-operative dairies.

On the morning of the 18th of October, the conference was addressed by the Hon. Sir Robert Carlyle. On the conclusion of the Hon. Sir Robert Carlyle's address, an informal meeting was held by the Registrars in which a number of interesting questions regarding the movement were brought forward and dealt with.

Dr. C. J. Owens on Co-operation.

Dr. Clarence J. Owens, the leader of the American Agricultural Commission, in an interview with a representative of the "*Standard*," stated that in the field of personal credit the Commission had been interested chiefly in the Raffeisen system, which originated and has been most highly developed in Germany.

CREDIT BANKS.

The Raffeisen system is founded on the theory that farmers acting together can borrow more cheaply than an individual farmer. It seems at first glance, said Dr. Owens, that the unlimited liability assumed by the members of such a society is unreasonable and dangerous; but the safeguards adopted by the society are so stringent that experience has shown that its losses are far less than the losses of an ordinary commercial enterprise This movement in Germany has resulted in a circle of farmers' banking institutions, with its centre in Berlin, and farmers are thus afforded a direct channel to the principal money market of their country.

Dr. Owens described the position of a farmer desiring to borrow from a commercial bank as being that of a man asking a favour. Commercial banks are formed to serve commerce, but the credit requirements of agriculturists are so distinctly different from the credit requirements of manufacturers and merchants that to favour the farmer a commercial bank is obliged to upset its whole routine. Contrasting the position of the European farmers with that of the American farmers "living on comparatively isolated farms," he said a mere borrowing and lending society is quite sufficient for the small farmers of Europe, whereas the American farmers require highly developed banking facilities. Then, too, the Raffeisen societies were organised in Europe at a time when there was no other source of credit available to the farmers, except the village money-lender, who practised frightful usury. The American farmers are in a very much better position than that. The United States has a more decentralised banking system to-day through its National and State banks than have the countries of Europe.

CO-OPERATIVE TRADING SOCIETIES.

Touching the question of co-operative trading, Dr. Owens said that if European co-operative purchasing and sales societies have an advantage over American societies at all, it is because of their superior command of credit. Co-operative credit is the logical basis on which to build a broad co-operative movement among the rural population. In Germany, such combinations have increased greatly the political and social influence of the farmers, and the same would be undoubtedly the case in America. It is simply the application to the rural population of those principles of organisation and combination which have been so successful in other directions.

OWNERSHIP OR TENANCY.

Questioned on the relative advantages of ownership and tenancy, Dr. Owens was emphatic in declaring that ownership was of pre-eminent advantage. The experience of the wide world justifies that opinion, and it is, indeed, from ownership that co-operation naturally springs.

Co-operation and Our Cottage Industries.

Prof. Radhakamal Mukerjee, M.A., explains in an informing article written to the October number of the *Modern Review*, three ways in which co-operation can relieve the Indian artizan classes. They are :—

(1) Co-operative finance providing the artisans with cheap credit.

(2) Co-operation in the purchase of raw materials, tools and appliances used in handicrafts.

(3) Co-operation in the sale of finished goods.

The professor has pressed into his service the experiences of the West, in the elucidation of these points.

He remarks that our small industries are greatly handicapped for lack of convenient credit. In his opinion, the establishment of co-operative credit societies amongst the artisans and the grant of loans from them to the artisans on a co-operative basis will be much more beneficial than grants of loans or machinery from Government.

Germany is the cradle of co-operative credit, and is imitated by her neighbours in her ways. The writer distinguishes two kinds of co-operative credit societies, The first is predominantly an association of industrial producers; the second entirely an association of agricultural producers. The former is mainly intended for industrialists, big and small; and the latter for the teeming agricultural population.

The idea of co-operative credit has not affected the Indian artizans to any very great extent. The Government, of course, help the spread of the movement as much as they can. In the professor's own words: "In those industries particularly, where the raw material is expensive the artisans, if anything, are more than other workers under the thumb of the money-lenders and will derive the greatest benefit from co-operative credit. Indeed, any hand workers by organising themselves in associations may also obtain credit much more cheaply and conveniently than they now obtain from ordinary money-lenders."

Indeed, there is no branch of an industry where co-operation cannot be introduced to infinitely more advantage. In the purchase and sale of raw materials, tools, implements, etc., and finished products, co operation can can do a great deal.

India, the writer concludes, has to develop on western lines in these matters. Of India's fitness to do so, the writer thus speaks:—"There are certain special circumstances which distinctly favour the introduction of industrial co-operation amongst our artisans. Our industrial population is organised into castes, marked by a spirit of association, solidarity and co-operation in social dealings. The caste traditions and the character of the people are thus distinctly favourable to co-operation for industrial purposes. Again, the form of industrial co-operation, though very recent in Europe, is structurally akin to the economic methods of our village community. In the village community, the village industrials are paid by the villagers, and the communal ownership of land, typical in the Indian village community, links itself naturally to the communal ownership of machinery and the implements of production as well as of the marketable wares, which is the object of industrial co-operation. Indeed there are the seeds in the Indian soil. The co-operator's labour and cultivation are required in order that this soil may yield a harvest possibly more abundant than that of the West."

Sir Robert Carlyle on Co-operation.

An address was given by the Hon'ble Sir Robert Carlyle at the close of the Co-operative Conference held at Simla, when he said:—"It is now seven years since I first attended a Co-operative Conference. We have moved fast since then and the infant of 1906 is now a vigorous youth. During the past year the loans advanced to members have increased by a crore while the membership of the societies in India has increased by nearly 160,000 to a total membership of 573,000. Including the families of the members there must now be 3,000,000 people directly interested in co-operative societies. The total population beneficially affected is much greater. Where the co-operative movement is strong the money-lender who wishes to keep his clients has to reduce his rate of interest and to show some consideration for his debtors. Taking this into account at least 6,000,000 people are benefiting either directly or indirectly by the co-operative movement. We, who are assembled in this room, know well that the co-operative movement means something very much more than the provision of cheap credit. Cheap credit is very important and without it material prog-

ress may often be impossible, but cheap credit, if given to a man not trained to its use, may prove his undoing. It will prove his undoing if all the use he makes of it is to borrow more largely for unproductive purposes.

Co-operation, if it is to be of permanent benefit, must teach the debtor how to use the money he borrows. We know even from our Indian experience how quickly a good society teaches this lesson, but for an object lesson one has to go to a country like Ireland where the co-operative movement, inaugurated and guided by Sir Horace Plunkett, is transforming the country. A debtor cannot be made a new man by a stroke of the pen. It is easy enough to get a number of cultivators to undertake to be jointly and severally responsible for the repayment of loans. It is constantly done by Government and the device has enabled Government to lend more freely and to dispense with troublesome enquiries as to the security each individual can offer. It is a device which has served, and will continue to serve, very useful purposes, but it is only a very short step towards true co-operation. By itself it does little to teach the debtor. This is why I have always urged great care in starting new societies, as we have to see to it that they are true societies and not mere aggregates of individuals. We have to make sure that our foundations are well and truly laid and this involves great labour, but labour which is well repaid.

The task on which you are engaged, gentlemen, is a glorious one. True co-operation will transform India. Where else can we find so strong an incentive to the now dumb masses to educate themselves? Where else can we find so admirable a training for local self-government? And remember this is bound to react on the larger political life of India. It is to co-operation again that we must all look for the speedy and effective introduction of agricultural improvement, as co-operative societies in some form or another will prove an effective link between the individual agriculturist and the Provincial Agricultural Departments.

It is not for me to advise you, gentlemen, on the details of your work, but there are some general principles which I believe to be of universal application. You should strive for steady and not for spasmodic growth, otherwise the strain on the staff becomes very great and the work cannot be really well done. Then, again, every effort should be made to develop other sides of cooperation, than the more obtaining of money on moderate terms. Here I would note that I believe it will generally be found a sound principle to confine every society as much as possible to one kind of work, as this will conduce to simplicity of working; and simplicity of working is obviously of very great importance for many reasons, but most of all because it makes it so much easier for all the members of a society to take an intelligent part in the proceedings. It is perhaps hardly necessary for me to add that it will often be desirable that many members of one society should also be members of an other society having a different function to perform. Every great movement, as it develops, has its own difficulties, which can only be dealt with by men who thoroughly understand the problem involved. At first enthusiasm and a thorough understanding of the general principles of co-operation would carry a man through. This will soon cease to be the case in any province. At every turn fresh difficulties will present themselves as new lines of work open out and even as old lines of work increase in magnitude.

Take, for example, the question of financing societies. In the early days the problem was a very simple one. In some provinces the question will soon become one of considerable complexity. Joint stock banks have been of great assistance in many cases in financing co-operative societies, and they have understood their own interest, and any large increase in the number of co-operative societies must, in the end, also greatly increase the business of joint stock banks. I doubt, however, whether joint stock banks will be able to give much help after a certain stage of development has been reached, as they cannot lock up any very con-

siderable part of their capital in societies which are unable to undertake to repay large sums at short notice. Take again the class of societies with which a registrar has now to deal. At first he had only to see to the working of village co-operative credit societies. Now he has to deal with very much more complicated societies of all kinds. The registrar of the near future will require before taking up his task some training not only in the general principles of co-operation but in the special features of the work in his province, and some knowledge of the general economic problem he may have to deal with will be very important. When we get to that stage—and in some provinces we have probably already reached it—understudies will be required to take up the work when a registrar vacates his post.

You may ask : What is the role of Government in this great movement ? My answer is that its main functions are to do what is necessary to secure public confidence and to ensure that societies are run on sound lines. Self-help is the essence of co-operation and nothing should be done to warrant co-operators looking to Government to help them when they can help themselves. If it were conceivable that Governments could be neglectful and indifferent it would be less injurious to co-operation than too much kindness. But you all know that neglect and indifference will not be your portion and that no Government will be found wanting when its help is required."

The Co-operative Movement.

Speaking of the economic effects of co-operation, Mr. Chatterjee, observes in his report for the year 1911-12 :—The progress made in the year in the liquidation of old debts due by members will be indicated by the following round figures supplied by some of the central societies :—

	Rs.		Rs.
Bulandshahr	15,000	Basti	2,000
Jewar	7,000	Sandila	21,000
Kuchesar	15,000	Hardoi	10,000
Moradabad	19,000	Bilgram	1,000
Bareilly	18,000	Mohanlalganj	6,000
Mainpuri	17,000	Kurwar	20,000
Budaun	21,000	Jagdishpur	20,000
Jaunpur	33,000	Fyzabad	9,000

These figures are not exhaustive, for all societies have not given definite statistics. Moreover in many cases members discharged old debts from the saving effected by them in a year of a bumper harvest and good prices. As mentioned in last year's report, debts secured by mortgage or hypothecation and carrying low rates of interest are best paid by gradual savings. The information regarding economic improvement from most districts is very interesting reading. In Rohilkhand cane cultivators are gradually giving up the *bel* system and shaking off the bond of the *khandsari.* Everywhere rural members have now got better cattle and are cultivating a larger area. In some of the eastern districts members of societies are finding it difficult to secure enough land for cultivation. In the village of Suarbarwa in Benares, inhabited entirely by Chamars, one man has built a *pucca* house, others have sunk two wells and one has taken up the varnishing of leather. Two Chamar co-operators in Benares have taken out endowment policies in a respectable insurance company. Instances of this nature can be multiplied. Above all the feeling that in times of stress and trouble loans on easy terms and self-respecting conditions will be available is a great incentive to the productive capacity of the community.

Co-operative Dairies.

The following particulars of the co-operative Dairy industry in Denmark have been gathered from a paper recently read by Professor P. V. Muller of the Elphinstone College, at the last Provincial Co-operative conference held at Poona.

The agricultural conditions in the little country of Denmark are somewhat similar to those prevailing in India. There is practically only one really large town, Copenhagen, and the great bulk of the people are small landholders. The Danish cultivator is said to be one of the most successful in Europe and this

success is held to be largely due to co-operation, not only in credit but in every branch of his activities. During the last forty years of the 19th century dairy-farming was greatly developed in Denmark and brought to a high degree of perfection by the application of scientific methods and the best machinery, as well as by the establishment of joint dairies. The Danish Government has assisted this development by granting money for experiment and by a rigorous system of inspection for the prevention of adulteration. In 1909 there were 1,157 Co-operative Dairies with a membership of 157,000, producing about 200 million pounds of butter annually. An average butter factory costs from Rs. 30 to 50,000 to start. When it is thought advisable to build a factory in a district, the necessary capital is borrowed usually from a so-called co-operative credit union and guaranteed by the local farmers, who are to be the members, in proportion to the amount of milk to be supplied by each of them. Strict rules are drawn up, members undertake to supply as much milk as possible, it is filled into special cans bearing their names and numbers. The rules as to cleanliness and the daily scalding of the cans with *boiling* water are very rigid. If any can arrives at the factory not properly cleansed or even if it has been rinsed with cold water only, this fact is at once detected by the smell. If very bad, the milk is rejected and returned, in any case the so-called yellow label of warning is sent back with the can, and so strong is now the feeling as to the necessity of cleanliness, that the receipt of a yellow label is a social disgrace in the village. The cans have to be placed out early in the morning by each member on the nearest road to his farm. Carts specially constructed to hold many cans and owned by the dairy drive round and collect the cans thus placed and return them with the skim-milk later in the day. About 6 A.M. the carts arrive at the dairy. The cans are received on to a raised verandah saving much labour in lifting. The milk of each member is weighed, usually, on an antomatic self registering machine. The cans after being emptied are inverted on a sort of travelling rack and the drippings collected into metal troughs. These drippings are very rich in cream and amount to a good deal in a day and the dairy gets them free. The milk is now filtered and is warmed by steam pipes in a double-jacketed cylinder to 60° celsins (or 140° Farenheit), which sterilizes it From the cylinder it runs into steam driven separaters revolving at 4,000 revolutions per minute, which removes the cream that goes one way into zinc tanks, while the skim-milk goes another into a second cylinder. Here this skim is reheated to 85° *C.* (or 185° *F.*) Thence it is weighed out $\frac{3}{4}$—sometimes 90°—of the amount being returned to the co-operators in the exact proportion of the quantity of the whole milk supplied by them, the $\frac{1}{4}$ being retained by the factory for cheese. The cream is now heated to boiling point (212° *F.*) and then cooled immediately and pumped into vats in another room, where it stands for 24 hours to ripen, before being made into butter on the following day. Lactic acid cultures—or less scientifically some of the previous day's churning—are used to sour the cream before it is churned. After churning, the butter lies in cement troughs filled with cold water for half an hour to give it texture. It is then washed, salted and moulded by machinery and packed into tubs. The tubs of butter are often sold through another butter export co-operative society. The buttermilk and the whey over from cheese-making is also taken by the members and the latter, especially, used for feeding pigs. In fact bacon is a by product of butter-making, but as that would be impossible here we must consider other possible uses for the skim-milk. All milk supplied is sampled by experts once a week. If any farmer's milk does not come up to standard he is warned and if not improved his milk is refused. Cleanliness is a "sine qua non" in the factory. The whole place usually flows with water. The cans are scalded out by being inverted over steam pipes. All the workers wear white overalls.

As to payment, after making a liberal deduction for working expenses—including interest and sinking fund on the borrowed capital—members are paid the full price of the unskimmed milk supplied whilst they take back the skimmed milk and the butter-milk and whey at fixed prices, often a little lower than their real value. The price of the stuff returned is deducted and the accounts settled weekly or fortnightly, but more often monthly. At the end of the year when the accounts are balanced, owing to the liberal deductions for working expenses, the free drippings, etc.—there is usually a large sum over for distribution, as members' dividend, to be divided proportionally to the sweet or unskimmed milk supplied. The constitution of the society is most democratic. Each associate has one vote and it is governed by an elected council. The dairy is managed by an expert dairyman, who in a large factory com-

mands a good salary. The dairies are united in a series of central federations for different objects. Thus there are societies for trade-marks for collective purchase of machinery, etc., and for exporting butter.

Co-operation in Russia.

The intellectual classes and the better educated peasants in Russia are evincing considerable interest in co-operation. A correspondent of the *Times* writes of this phase of rural activity : " But the enthusiasm of to-day implies more than organisation of facilities for buying, selling or banking—it aims at the mental, moral and economic uplifting of the Russian peasantry, and in this lies the source of its idealism and attractive power. The success of the Co-operative movement is therefore closely linked with the progress of civilisation in Russia." The tendencies generally observed in countries where the movement has been worked successfully for a number of years are at present noticed in Russia—the linking of the different forms into a powerful organisation, establishing intimate relations between credit trading and distributing Societies, etc. There would appear to be twenty-two periodicals devoted to the propagation of the principles of the movement. Besides, the Co-operative Congress is an institution which has been recently established. The magnitude which this movement has already attained in Russia may be seen from the fact that there are at present 20,000 various Co-operative Banks, with a membership of 4,660, 833, a capital of £50,582,000 of which the State has contributed £18,222,150. It is stated that out of every 1,000 householders in European Russia, 183 are Members and the principle is being rapidly taken up in Siberia. Of the operations of these Societies, the correspondent says:—" The chief transaction of Co-operative Banks is the lending to peasants of small amounts of money for productive purposes. Many difficulties handicapped this work, and the Co-operative Societies safeguarded themselves from loss by means of the high rate of interest of 12 per cent. They are now trying to reduce this rate, and this is a sign of greater confidence in the economic and moral position of the peasantry. The Co-operative Banks have lately entered a new field of operations They undertake the business of advancing loans to peasants against corn, of building granaries and elevators, and of helping the agricultural population to dispose of the harvest more profitably." There have been started since 1910 Agricultural Co-operative Societies for a variety of purposes. Last year there were nearly 400, of them, devoted to gardening, bee-farming pisciculture and dairy farming, co-operative use of agricultural machinery and breeding of sheep and pigs. Whilst in 1907 there were only six co-operative dairy farming Societies in Western Siberia, there were 60 Societies in 1910, 107 in 1912, and 130 in 1913. Two-thirds of the milk exported in 1911 from the Tobolsk province came from Co-operative organizations and 44 per cent. of the exports from the Tomsk province came from the same source. The federation of Siberian Co-operative butter producers has had an agency in London since 1908, and exported last year butter to the amount of over £5,000.000. Last year a "People's Bank" was opened in Moscow to assist the various Societies in their commercial and financial transactions. The chief shareholders of the Bank are 1,491 Co-operative organizations. The capital was over £100,000. There is a peculiar feature about the organisation of these Co-operative Societies. The Co operative movement receives assistance from the Russian local government bodies. The Zemstvos are morally and sometimes financially helping the Co-operative Societies, and are, moreover, co-operating among themselves, organizing on a large scale the sale of the *koustarny* products of the peasantry, or promoting on co-operative lines the construction of refrigerators for the transport of eggs and butter. There are, of course, also the distributive Societies. Of 6,730 such Societies registered up to January 1, 1912, 4,716, or 70 per cent., were village consumers organisations. The distributive Societies have a membership of one million, and are aiming at supplanting the village shop-keeper, who used to exercise heavy pressure on the peasantry They supply their members with all the necessaries of life, and divide the profits among the members in proportion to their purchases. Their object is to buy in the best and cheapest markets, and they are now farming federations in various provinces for wholesale buying. The largest and most influential wholesale Society is the " Moscow Federation of Consumers." In 1911 the turnover of this concern amounted to £325,600, and in 1912 to £501,400. The Moscow Federation has agencies in Keiff, in Belotzerkoff, and in Rostoff, and is opening one in Odessa. The federation is trying to centralize all consumers' co-operative organizations, but is meeting with opposition on the part of the provincial federation.—*Hindu.*

The Industrial World.

Paint for Iron.

In a Carnegie memoir submitted to the Iron and Steel Institute by Dr. J. Newton Friend, some useful information is given as to the value of paint as a preservative for iron and steel.

Dr. Friend's results reveal a number of interesting facts of considerable technical importance which are summarized by the *Iron and Coal Trades Review* as follows :—

(1) The surface of a paint film does not always give a correct idea of the extent of corrosion taking place beneath.

(2) The addition of small quantities of paraffin wax to paint destined for the protection of iron and steel exposed to the air reduces the corrosion very appreciably. If the paint is required to set at the normal rate, not more than 1 lb. of wax should be used for every 1,000 lbs. of oil present in the paint. If, however, the rate of setting is less important, the amount of paraffin wax may with advantage be increased to 3 lbs. per 1,000 lbs. of oil. This latter is roughly speaking equivalent to 2 lbs. of wax per ton of ready mixed paint—an estimate that is sufficiently near for the purpose.

(3) In the case of plates immersed in water, the addition of the paraffin wax seems rather to assist corrosion than to diminish it.

(4) A fine pigment is superior to a coarse one in the preparation of protective paints, a fact which is now generally recognised.

(5) It is generally believed that two coats of paint preserve an iron surface from corrosion considerably more efficiently than one coat. Liebreich and Spitzer have recently called attention to the fact that in their experiments, by increasing the number of coats of paint not only was the corrosion not reduced, but it actually increased, as if the extra coats stimulated corrosion. Dr. Friend's results lend support to the work of Liebreich and Spitzer.

(6) It is always found that a rusty surface when painted yields unsatisfactory results, and the careful painter removes the rust prior to the application of paint. Undoubtedly this is necessary in damp weather, and it is also necessary to scrape off any scale and thick coats of rust.

It occurred to the author, however, that a slight coating of rust, absolutely free from caking and lumps, might be an advantage rather than otherwise, if perfectly dry for two reasons :—(1) Fine rust is practically a pure ochre, very free, in the case of wrought iron and steel, from silica. Hence the surface is very absorbent, and if painted with a good coating of thin paint a similar result may be expected as by first laboriously cleaning the metal and then painting with a thicker paint—that is, one containing more pigment in proportion to oil than the former. (2) If the iron surface is sand-papered down it is made much smoother, and its area is reduced to a minimum. If, however, the rust is left on as a thin coating, the underlying surface of metal in contact with the rust is slightly pitted and uneven. Hence when the paint is applied it has a larger surface to grip, and its tenacity will therefore be increased in proportion.

It was found that plates suffered far less from corrosion when painted in a rusty condition than when first polished bright before painting. This is a remarkable result. It would seem, therefore, that when the painter is called upon to protect by painting thin sheets of iron, such as galvanised iron, which has already rusted somewhat, any lumps of scale should be removed, and a coat of paint applied in warm, dry weather to the rusty surface. The danger of the sheets rusting through will thus be considerably less than if the rust is first carefully scraped off and the metallic surface polished with sand-paper be-

fore the application of paint, as is the more usual custom.

Plantain Wine.

Mr. T. V. Subramanian writes from Madura:—I have been carrying on a series of experiments of late to find out if any of our country's products can be converted into materials that would command a wide European market. At last I have succeeded in manufacturing (for experimental purposes) a very delicious wine from our Indian plantain. This idea was suggested to me by a note in a back volume of your journal wherein you said that the Americans have put upon the market a wine prepared from the Banana—which corresponds to our plantain.

2. As I am not a capitalist myself I tried to pursuade some very wealthy Indian gentlemen to open a factory for that purpose But none of them would invest their capital in a doubtful venture like this. They were not even sure of the success of the undertaking as I am not a European and in their opinion no one but a European could ever discover anything useful.

3. With a view to materialise this knowledge I offered to sell it to some European firms and all of them had at least the politeness to reply. One firm asked for a sample which I have already sent. Another is willing to purchase the secret. But I am now unwilling to sell the secret—which means a new Industry—to European firms. There is a good opportunity for our countrymen to make money and I would feel very thankful if you or any of your readers can tell me the name or names of any native gentlemen or firms who are likely to profit by the information.

4. I may inform you that I have also prepared a wine from the juice of the common prickly-pear fruit and I shall gladly answer any queries from your readers on this subject.

5. Hoping you would publish this letter in your valuable journal.

Timber Creosoting.

The treating of timber so as to preserve it against its natural enemies is an all-important problem now-a-days in view of the enormous depletion of the world's forests and the rise in the price of lumber. Many processes for this purpose have been invented, of which the most successful has been creosoting. By what is known as the Ruping process of creosoting, which is being extensively used in Europe, many improvements have been effected upon the older system. By driving the oil into the heart of the wood the process is more thoroughly carried out with a reduced consumption of creosote. This is done by placing the wood in a chamber or retort under heavy atmospheric pressure. Then the cylinder is filled with creosote, the air pressure being maintained, and the oil is thus forced well into the wood. Finally the pressure is raised to as much as eighty pounds a square inch, which is sufficient to drive the oil almost to the centre of the timber under treatment. In regard to the preparation of telephone and telegraph poles and sleepers, &c, creosoting is all important, and it should be noted, that unlike the earlier method, the Ruping process, enables white wood to be dealt with as efficiently as other timbers.

The Revival of Indian Industries.

"Wealth is to a nation what life is to a man. Food feeds a man and preserves life and industry promotes wealth and preserves the life of a nation. If we inter in the grave our industries we have simultaneously interred our national existence. Politics is secondary and economics primary."

These are words, which we take from an article in the *Modern World*, written by Mr. Jessraj Singhji Sessodia, to taunt our idle Indian capitalist with the meaning of their import. In the same article the writer speaks of the way to revive Indian Industries. Individually, we have no capital. If there is the capital, where is the trust and mutual confidence? The solution lies in Co-operation. It minimises risk and promotes habits of thrift and industry.

So, "We must develop the co-operative spirit. Co-operation is the first and foremost thing needed to secure capital for our industries."

In the opinion of the writer, the revival of Indian industries can be accomplished with greater ease by the Sovereign princes of India.

Would India like to live or die? If she would like to live, she needs " must revive her industries with accelerated speed and unbounded activity."

The World's Cotton Trade.

A Consular report from New York states that the world's output of cotton goods for 1912 totalled $100,000,000 in value, of which $650,000,000 was for cotton tissues.

According to the statistics taken at the end of March last the number of spindles in operation in India was 6,400,000.

England operates twice as many spindles as the United States and more spindles than all the rest of the world combined with the exception of the United States. In the manufacture of cotton tissues England holds the first place, followed by the United States, which is in turn followed by Germany, Russia and France. In the export of cottons England heads the list, France coming next, with Germany third. In cotton goods England is still supreme. The United States has long been competing with Germany for second place, but still remains third on the list. China and India are still the best markets for English cotton fabrics, while the best markets for American cotton cloths are Canada, the Philippines, and parts of China.

The export of cotton fabrics for 1912 by India is worth about 2,20,00,000 rupees and the import of cotton tissues for the same year amounts to about 44,00,00,000 rupees.

A Bath of Kerosene.

Few things of western manufacture have taken on in India more completely than cheap clocks and watches. Their cheapness is amazing, and if their life is short, it is a circumstance to which the Indian has for ages been accustomed. When a cheap watch succumbs either to violence or the curiosity of its owner, it may still be used as an ornament and regarded as jewellery. Its greatest enemy is however the man who trades in watches and calls himself a watchmaker. This man in very many instances never served any kind of apprenticeship, he could not turn a pinion or make a well-finished screw, but his business is to make work. The smallest derangement is an excuse for general cleaning with a charge often equal to half the value of the watch, and, as a rule, the beginning of the end dates from the first repair by the watch-dealer. The end of course means the purchase of a new watch.

Considering that the whole work of the watch spring consists in turning the wheels and hands, the very small power required is easily interrupted. A particle of sand, or of any fibre from the clothing, is enough to stop the movement. This particle may be easily removed from a watch by a bath of petrol in a cup. The watch must be opened and left for an hour in the liquid. It is then removed and pure petrol is poured through the works, while the hands are pressed very lightly forward and backward, so as to loosen anything among the teeth. After washing, the watch may be drained and dried in a place free from dust.

The cheap American clock that is sold in thousands seldom dies a natural death. It is either disabled by a fall or other violence, or gummed up by injudicious oiling and dust, for the case is never air-tight, and all the dust carried in by air currents is deposited within and left there. When one of these clocks stops and is taken to a repairer, the price asked to put it right is generally sufficient to bring about the condemnation of the timepiece. It is scrapped, and gives place to a new one. If the owner of this clock had given it a good soak in kerosene for an hour and then worked it up and down in the liquid to wash out the dirt, it would probably, after draining in a warm place, have gone as well as ever. The old, thick oil will have been dissolved, and washed out, and if a very little good sewing machine oil is applied with a fine pointed stick, a renewed career is open to the clock. Although the amateur may with safety deal with cheap timepieces, he must be very careful about

meddling with the better class of instruments. It is too risky. His better plan is to have the watch or clock examined by the repairer in his presence, and learn at once what is wrong, and what it will cost for repair. The kerosene bath has a wide field of utility beyond the cleaning of clocks. Nothing refreshes a sewing machine so promptly as washing its details in this liquid, an old tooth brush being a valuable aid in this process. Guns and revolvers, locks, type-writers and many other articles that are liable to be clogged with oil come into the list. The kerosene, after standing awhile to deposit any solid matter, may be bottled, and set aside for further similar use, as if it has dissolved much oil, it will not be suited for use in a lamp.—*The Indian Textile Journal.*

The Composition of Sole Leather.

In a *Bulletin* (No 165) just issued by the U. S. A. Agricultural Department, Messrs. F. P. Veitch and J. S. Rogers furnish the results of analysis of a number of leather samples of various tannages examined at the Leather and Paper Laboratory at Washington. Incidentally the authors throw some interesting light on the extent to which certain objectionable practices such as the "weighting" of leather with glucose, Epsom salts, barium and lead sulphates, are resorted to in the States.

Of a very large number of samples of sole leather analysed by the authors about sixty-three per cent. were found to be weighted with Epsom Salts or glucose, or both. The amount of Epsom salts used varied from 1 to 7·3 per cent., with an average of 3 per cent., and glucose up to 10·4 per cent., with an average of 5·5 per cent. Where both were present the maximum was 16 per cent. with an average of 8 per cent. It is calculated from the results obtained that not less than 12,000,000 pounds of glucose and Epsom salts are sold annually in sole leather to the American public. The materials, it is observed, add absolutely nothing to the wearing value of the leather, and where present in large quantity may positively decrease its wear. Shoes made from these leathers are readily penetrated by water. Loading makes leather more costly, consequently an inferior leather costs more than a good leather.

Do International Exhibitions Pay ?

Considerable discussion is taking place in the European and American Press as to the value of International Exhibitions. Whether sentiment or sound Commercial instinct gave birth to the idea of holding such exhibitions, it has been found not to pay for great manufacturing houses participating in them. Here is the testimony of Germany, found in an article written to the *Financial Review of Reviews* by Mr. Percy F. Martin, F.R.G.S.

The practical Germans have discovered that it does not pay to participate in international exhibitions, even when these enterprises are held somewhat nearer home and under more responsible auspices. The English have had this experience on many previous occasions. Why ? The purchasing public, if anything, studiously remains away from these exotic displays, preferring leisurely to examine and, if necessary, bargain for goods which have not received doubtful *cachet* of close public examination and candid criticism. It has also been found that the actual amount of new trading met with as the result of such enterprises is infinitely small in proportion to the actual amount of public attention directed to them.

An important defect of most international exhibitions is, says the *Manchester Guardian*, that the majority are necessarily held abroad, thus enhancing the cost of exhibiting and reducing the average recompense.

It is right and proper that an Exhibition should be arranged when a national or Local Government wishes to commemorate some event or call the attention of the world to the progress it has made. But, cautions the *Commercial American*, "there has developed a tendency, which unless corrected, promises to rob the general exposition of much of that high standing and success it deserves. The evil is multiplicity. Too many exhibitions have been held at the same time or with such a short interval between them as to be practically simultaneous. This multiplicity is not only an

evil in itself, but experience has proven that it paves the way for a growing number of fictitious shows."

Many Governments have officially recognised the evil. The recommendations adopted at the recent confer ence which met in Berlin in October last, if gene rally followed, would take the exposition back to its original purpose and make exhibitions, what they have not been of late years, a boon to Governments, manufacturers and merchants. The report adopted provides in the main that international general expositions are only to be held at three-year intervals, and that an interval of ten years must elapse between the holding of two general exhibitions in the same country. Other recommendations concern the treatment of foreign exhibits, the award of medals, precautions against bogus expositions and prohibition of the sale of awards.

Noise and Factory Efficiency.

A large part of the noise in a manufacturing plant may be translated into loss of power, unnecessarily rapid depreciation of equipment, and a reduced efficiency of employees resulting from the distraction which is created and from the indirect effect upon physical health. Many users of machinery have awakened to the fact that their manufacturing rooms should be as quite as possible and in selecting new equipment have had this in mind. Some operations cannot be performed without disturbing sounds. The press and the hammer must strike a blow; the circular saw and the knives of the table planing-machine must shriek their way through the material. But the belts and gearing and other parts of the mechanism need not add to the necessary noises until there is a bedlam of unpleasant vibration.

Some machinery designers have gone ahead rapidly in making improvements in this respect. Indeed, a great deal of information is available, for there has been much scientifically directed research, the result of which is no secret. The primary purpose was to reduce loss of power and prolong the useful life of the machine by eliminating friction The secondary and hardly less important advantage achieved is a nearer approach to quiet. A striking example is given in a paper recently prepared by E. P. Bullard, Jr. Investigations which he directed at his works in Bridgeport, Conn., proved that gears running above 600 peripheral feet a minute are liable to be noisy, whereas gears running under that speed are quiet. The text books put 1,200 feet as a limit, he explained, and automobile designers run gears up to 2,000 feet at times, but on a low gear and at maximum engine speed.

To produce quiet running at the higier speeds, the gears must be most perfectly fashioned. In some of the machinery produced to-day the gear speeds are excessive when compared with the accuracy of the machinings, and they are consequently noisy, and the fault increases with use.

Another typical factor of design which may lead to noisiness, through frictional troubles is that of lubrication. The oil can is losing its importance where well-designed machinery is used. This is a most excellent change, for the possible troubles due to carelessness and neglect are done away with. Automatic lubrication replaces many oil holes. These are only examples of the possibilities of design which make themselves known by noiseless running—*The Iron Age.*

Pulled Wool or Shoddy.

In Nature's ecomony there is no such thing as waste and it will be a revelation to many to be told that what is neglected and thrown away as 'rags' is really a product of high economic value.

In 1860, 16 million pounds weight of woollen rags were imported into the British Isles; in 1870 the weight was 38 million pounds; in 1880 it was 92 million pounds; in 1912 the British people took from other countries no less than 56,338 tons. This is an amount largely in excess of all the wool grown in the British Isles, and is a fact that is easy of proof, that the proportion of rag wool to raw wool, imported from all parts of the world, has been a steadily increasing ratio during past decades.

How much weight of rags actually goes every year to the pulling machines (or "devils" as they are called) in the neighbourhood of Dewsbury there are no figures to show, but there is little doubt that the amount must be well over 200 million pounds weight per year. Contrary to the theory which is usually accepted, that raw materials lose considerably in weight in the manufacturing process, rags gain in weight in their conversion into shoddy. This is due to the large amount of oil that is added to them in the process and if we leave the increase in weight out of account, we find that about four pounds is produced each year, for every man, woman and child in the British Islands. That is to say that every man may have a complete suit of shoddy every year if he chooses, and some must have more than one.

A writer in the "*Waste Trade World*" says that the Dewsbury and Batley district is now attracting to itself rags from every part of the civilized world, and from some parts that are regarded as uncivilized. Rags to-day are divided into a vast number of classes, Everything is done and must be done to save unnecessary expense, particularly the expense of re-dyeing and carbonizing, therefore cotton must be separated from wool, and part cotton from them both, because part cotton rags must be carbonized. All black must go by itself to make a black yarn without being dyed again, and all navy by itself for a like purpose. Soft spun goods must not be mixed with hard, long-fibred with short, if the best results are to be obtained.

The shoddy trade is a marvel of human ingenuity in that it transforms 'useless' woollen rags into finished products of marketable value.

The shoddy trade is in fact a clever as well as a very "elastic" trade, and there is no better way to make this clear than to make oneself acquainted with the uses and destiny of woollen rags.

Shoddy is the fibrous material which results when unmilled cloths such as serge, cashmeres, hosiery, the like are "pulled," that is to say, when they are beaten so hard by the pegs, in the "Devil" that they break up into their constituent fibres. This must not be understood that fibres after they are pulled are similar to what they were soon after they came from the sheep's back. In the first place, most of them are dyed, in the second many of them are broken, and therefore much shorter than they were originally, thirdly, they are worn. The natural roughness of the surface is not always in its original condition, and where the serrations have been badly damaged in the process, spinning power is very often again diminished thereby.

Mungo, as opposed to shoddy, is the product of cloths which were milled in their first existence. In other words, it is made from old dress cloths, old dress uniforms, waiters' clothes and any other dress (woollen) face fabrics. Mungo is shorter than shoddy for two excellent reasons. In the first place there are few exceptions to the rule that woollen cloths are milled and worsted cloths are not. Woollen also consists of shorter fibred material than worsted. The reasons for its shortness of staple are therefore two-fold, firstly, because the cloths from which it is made were themselves made originally from short wool, secondly, because the fibres are so tightly bound or felted together in the milling process that most of them are badly broken before they can be separated again.

Extract is a third-class of pulled or disintegrated rags. It is made from fabrics, either milled or unmilled, that have originally consisted of both cotton and wool These rags have all their cotton "extracted" from them by any of the various carbonizing processes. They are sold in a condition of absolute freedom from cotton, but the acid and the heat of this process leave their mark on the fibres, and it is seldom that they are passed off in the same category as products of pure wool cloths.

Shoddy is otherwise known as 'worsted.'

Shoe Polishes.

We take the following from a paper read by Dr. J. T. Donald before the Society of Chemi-

cal Industry:—These (shoe polishes) constitute by far the most important part of the output of a factory both in volume and money value.

The shoe polish almost universally used a generation ago, was made by mixing together some form of bone charcoal, sulphuric acid, neatsfoot or other oil, and molasses or other form of sugar syrup. The carbon imbedded in a paste of sulphate of lime was the chief factor in the polish developed by friction. Modern shoe polishes are prepared along entirely different lines, waxes being the bodies responsible for the polish or gloss.

For ordinary leathers, the requirements of a good shoe polish are, that it shall give a high gloss with a moderate friction, shall not be sticky or hold dust, shall be waterproof, and shall not soil clothing that may come in contact with the shoes.

Carnauba wax with its hardness and high melting point is the basis of modern friction polishes. The cheaper candelilla wax may to a certain extent replace the carnauba with but little difference in the quality of the polish.

There are two chief methods for working these waxes into polish : The wax is emulsified by boiling a solution of borax. The product is known as white stock. If polish is to be in the form of paste, the white stock while hot is mixed with a hot solution of ordinary laundry soap and sufficient nigrosin to give the desired depth of color. The mixture cools as a soft paste that may readily be applied by means of a brush or sponge. If the polish is desired in the liquid form, the best grade of castle soap is used ; a solution of this variety of soap does not gelatinize. Numerous trials have shown that no matter how dilute the soap solution—a satisfactory liquid cannot be obtained unless castile soap is used. Both the paste and liquid forms are widely used. With a moderate friction, the hard waxes held upon the leather by the soap, give a beautiful and very desirable polish.

The second method of dealing with the hard waxes is as follows : Carnauba or candelilla or a mixture of the two with beeswax and ceresin or paraffin is dissolved in hot turpentine and mixed with very finely pulverized bone charcoal. When properly cooled there results a firm paste that spreads rapidly under a brush or sponge. When this mixture is poured into boxes it must be promptly cooled otherwise there is a separation of the harder waxes from the solvent, the result being a granular sloppy mass instead of the firm paste desired. If the harder waxes alone were used it would be difficult to prevent separation from the turpentine on cooling, hence the admixture of softer waxes. Beeswax gives also a toughness or lack of shortness to the paste and a smooth finish that cannot be obtained without it. These softer waxes reduce the gloss available from the carnauba or candelilla. The use of bone black as a coloring agent is an attempt to overcome the weakness inherent in the use of the softer waxes and to add to the gloss obtainable from the waxes that obtained by friction of the bone carbon.

For tan leathers the same goods are used except that a brown or yellow dye and pigment replace the nigrosin and bone char. The application of the tan polish is frequently preceded by the use of a cleaning solution to remove stains and discoloration.

A popular cleaner is a mucilage of gum tragacanth containing a small percentage of oxalic acid. So remarkable is the power of tragacanth to hold water that this article, in appearance a thick cream, is 97 per cent. water, gum and acid constituting the remainder.

The Industrial Conference.

The Seventh Session of the United Provinces Industrial Conference was held at Fyzabad and this year Mr. C. Y. Chintamani, Editor of the *Leader*, delivered the presidential address. The address comes as a despairing echo of the note of alarm that is heard in the industrial atmosphere of India by the recent failure of more than one bank of indigenous growth and enterprise. Mr. Chintamani after pointing out these industrial failures ascribes them to some national characteristics of Indians. In his opinion they are :—

A superstitious hatred, fostered by religious

beliefs, of the idea of accumulating riches; a lack of thoroughness, and inattention to details, an easy-going sense of responsibility, a total obliviousness to the value of time, the national weakness of not doing to-day what can be put off till to-morrow, a proneness to take up a task without counting the cost, a habitual reversal of the honest counsel 'be slow to promise but quick to perform (particularly in pecuniary matters), the general absence of what Lord Haldane has called 'the ambition to excel,' an aversion for manual labour and indeed for sustained work of any kind if it has to be continued for long, a sensitive self-respect which asserts itself only on the wrong occasion and distorts a needed correction into a deliberate and unforgivable offence (a defect which is liable to arrest many a promising youth's advancement), and an impatience of results. Mr. Chintamani avers that a "very revolution in our ideas and ideals is a *sine qua non* of our emergence as an industrial nation."

Referring to the Swadesi movement, Mr. Chintamani considers that "during these eight years (it) has been less of a success than it is claimed in some quarters to have been and that if earnest Swadeshists do not examine their position and revise their methods their good intentions would not avail to save the movement from a collapse even more complete than we have had painfully to witness. Mr. Chintamani admits however that Swadeshism "has turned our eyes to our economic helplessness, it has awakened in us a keen solicitude for the development of manufacturing industries and for the support of indigenous in preference to imported articles, it has led to the investment of more money in trade and industry, it has given a much-needed stimulus to our patriotism."

For the immediate future of industrial India Mr. Chintamani suggests the following line of action :—

(1) that the youth of the country should not go only for service and law;

(2) the co-operative movement should be widely extended;

(3) the efficiency of labour should be increased;

(4) agricultural occupation should go hand in hand with manufacture;

(5) people should be cautious in starting new enterprises;

(6) that the cottage industries should be revived.

Then the President rightly called attention to the paucity of State aid to Indian industries. He said that Germany owed her large success to the institution of a large number of State-aided technical institutions, etc.

Mr. Chintamani suggests that (1) there should be one well-equipped technical school in every revenue division.

2. The Government should take up seriously the problem of the education of the labourer, and besides stop the system of indentured emigration.

3. The Government should ease the burden on the land, seeking for additional revenue in an increase of customs duties, and seriously apply itself to a solution of the problem of agricultural indebtedness.

4. The Government ought to help our industries and handicrafts by providing expert advice, advancing loans, by subsidising and by pioneering particular industries which there may be no other means of bringing into existence.

5. Indians should be given facilities to purchase shares in Anglo-Indian Companies.

6. The Government should give preference to Indian over foreign goods in making its enormous purchases, should see that the railways would at least not put Indian industries to loss by the manner in which that tariff is framed, that it should not hesitate to levy protective duties for temporary periods for the benefits of particular industries which could only take root with such assistance.

Mr. Chintamani closed his rather long address with this gospel, 'Never sit down with a tear or a frown,' but work, work, work.

The Commercial World.

Indian Cinematograph Films.

We have read of a proposal made in the *British Trade Journal* regarding the formation of a company with a capital of £20,000, for biographing Indian scenes for purposes of cinematograph shows. The films that are at present shown in India are particularly all concerned with Western subjects, which the audience is either slow to follow, or appreciate. It has been asserted that if Indian films showing Indian life are shown, the cinematograph theatres will make lucrative business. We think there is sufficient field for exploitation by such a company.

Business Enterprise in India.

The business enterprise of India during the month of July 1913 is shown by the following abstract of Joint Stock Companies registered in that month.

		Rs.
2	Banking and Loan Companies	5,65,000
8	Insurance Companies ...	52,00,000
10	Trading Companies ...	55,45,000
1	Cotton Pressing Company ...	1,00,000
1	Saw and Timber Mill Company	1,50,000
2	Tea and other Planting Companies ...	4,25,000
1	Ice Manufacturing Company ...	20,000
25	Grand Total...	1,20,05,000

Definition of "White lead."

In a recent case which came before the King's Bench Division of the High Court, the point arose as to the technical definition of white lead The plaintiffs brought an action on the ground that the defendants had supplied, under the name of white lead, a pigment which was of different composition, being composed not of hydrated oxy-carbonate of lead, but of sulphate of lead. Eventually the parties mutually agreed to settle the action, the defendants admitting that any pigment sold as white lead should not be other than hydrated oxy-carbonate of lead, the plaintiffs withdrawing all accusations of fraudulent misrepresentation. The matter is of general interest, because it is important that the meaning of trade terms should be clearly and accurately defined.

Capital of Joint Stock Companies.

In the discussions regarding the recent bank failures, several terms are freely used such as (1) nominal capital, (2) issued capital, (3) paid-up capital, (4) fixed and floating capital, (5) loan capital; and not many may know their full significance.

The amount named in the memorandum of association is termed the nominal capital of the company, *e.g.*, "the capital of the company is £200,000 divided into 200,000 shares of £1 each." If half of this amount has been issued, the issued capital would be £100,000. Assuming that of this amount £30,000 has been issued to vendors in the form of fully paid shares and that £70,000 has been issued to the public, upon which ten shillings per share has been paid, then the paid-up capital is £65,000. The uncalled capital would, of course, be £35,000, viz., the remaining ten shillings per share which would be liable to be called up by the directors. Another name for the 70,000 shares taken up by the public would be "subscribed capital." The capital of the company invested in land, factories, or machinery, in other words in assets intended to be retained and used in the business, is termed "fixed capital," as opposed to "fleeting or circulating capital," which is property acquired or produced with a view to being sold, *e.g.*, the stock-in-trade of a drapery business. Loan capital is a misnomer, as it is not part of the capital of a company, but is money barrowed by the company, and usually on Debentures or Debenture stock.

Overland Postage Traffic.

There has been considerable growth in the Overland Postage Traffic, as is exemplified in

a statement published by the Director-General in an official note from which we extract the following :—

Despatched from India to United Kingdom.

Year.	Letters and postcards.	Newspapers and packets.	Parcels.
1881-85	... 2,687,915	741,666	22,146
1886-87	... 3,099,565	1,138,604	38,353
1891-92	... 3,500,094	1,354,648	53,998
1896-97	... 3,037,334	1,017,883	74,710
1901-02	... 3,912,481	1,308,358	75,996
1906-07	... 7,806,457	1,553,210	122,460
1911-12	...12,305,857	3,343,831	127,010

Received in India from the United Kingdom.

Year.	Letters and postcards.	Newspapers and packets.	Parcels.
1881-82	... 2,565,696	4,035,234	59,812
1886-87	... 2,991,707	5,251,968	47,905
1891-92	... 3,809,075	6,155,439	80,704
1896-97	... 3,174,487	5,624,419	87,723
1901-02	... 4,707,466	7,933,112	122,390
1906-07	... 8,657,957	11,507,783	235 695
1911-12	...14,447,136	13,336,028	332,603

There has been a similar increase in the exchanges with countries other than the United Kingdom as the following statistics will show:—

Year.	Letters and postcards.	Newspapers and packets.	Parcels.
1881-82	... 1,200,525	603,022	6,879
1889-90	... 2,883,084	1,935,700	18,960
1899-00	... 4,267,292	2,960,606	98,886
1907-08	... 8,682,050	6,586,388	226,055
1908-09	... 9,064,783	7,061,990	235,840
1909-10	...11,875,513	7,562,282	267,947
1910-11	...12,239,162	9,596,587	314,318
1911-12	...14,528,722	9,447,425	348,516

This encouraging sign has led the Director-General to remark that "the time has, therefore, come when the predominant position occupied by India among British possessions should be recognized by the introduction of a second fast regular weekly mail service between Europe and India, preferably between Karachi and, say, Marseilles and London."

Motor Lorries.

At the meeting of the Imperial Motor Transport Conference held in London sometime ago, a discussion took place on the design of colonial and military motor-vehicles and the relation of British manufacturers with buyers overseas. Colonel R. H. Ewart (representing the India Office) said that they had great hopes that in the near future a few motor-vehicles would be sent out to India for experimental purposes. They would be placed at important centres where they could be seen by commercial users. At present in India the chief form of transport was bullock carts. They had to mobilise large numbers of these for communication work in time of war, and the utmost speed they could rely upon from such vehicles was about one and half miles an hour. It took six bullock carts 80 days to do what one transport lorry could do in ten, apart from the fact that only one man was required to look after the latter compared with 35 for the former. There were so far as they could ascertain only 35 commercial motor-vehicles in the whole of India and Burma up to March last which could be made use of, and of these the huge railway system of the country could only lay claim to 14.

A limited company is however shortly to be launched in Bombay to import the necessary fleet of motor lorries to surpersede bullock carts. The proposal is to import, at the outset, a fleet of about 20 motor lorries at a probable cost of Rs. 2,50,000, which will make the use of bullock carts in carrying large & increasing loads of merchandise in Bombay from one place to another unnecessary, and, when the fleet is added to, the suburbs will be included. At present the price of carting cotton goods varies from six annas to ten annas, the average being six annas in the dry weather and ten annas in wet weather, per bale of 400 lbs. of cotton from Colaba to Parel; while the new transport company propose to charge only five to seven annas throughout the year according to distance. It is expected that these motor lorries will be running on the streets of Bombay by the end of November.

India and Manchester.

The hold that Manchester has on the Indian Market, made only too easy by the Fiscal Policy imposed on India, combines in it a source of strength and of extreme vulnerability This has been brought out in the course of his Presidential address at the half-yearly meeting of the Manchester Chamber of Commerce held on July 23rd, by Mr. Edward H. Langdon. He said, "Of the total exports of cotton piecegoods, India, including Ceylon and Burma, has received :—

	1910.	1911.	1912.	Jan.-May, 1913.
In	37·25%	36·85%	40·99%	43·92%
				Jan.-June, 1913.
Of Grey Goods.	56·82%	57·21%	61·52%	64·27%
,, Bleached.	35·80%	34·13%	36·74%	39·74%
,, Printed....	29·74%	29·09%	31·70%	36·22%
,, Dyed. ...	16·39%	16·29%	17·30%	20·85%

Thus India has received latterly more than two-fifths of the production. "What is the chief lesson we derive from these figures? It is that on no condition whatsoever dare we embark on any experiments in fiscal legislation, or we shall at once imperil the main Lancashire industry, which finds employment for more operatives and has invested more capital than any branch of manufacture in Great Britain. From the figures quoted it will be seen that the percentages of bleached and printed goods sent to India are well over one-third of our total exports, but in grey goods India is absorbing close on two-thirds of our shipments. Now it may sound paradoxical, but this immense trade with India does to a certain extent adversely affect our exports to other countries—of course a manufacturer cannot sell and deliver the same goods twice over, and when he has once completed a sale at a satisfactory price he is content; the result is that the good demand from India naturally enhances prices and curtails, or in some cases actually stops, sales in the minor markets, where, when prices exceed a certain maximum, buyers can no longer import such goods as can only be sold at a fixed selling price, which never varies. If this continues for any length of time, it may be that the article disappears entirely from that market, and other fabrics possibly take its place. In his most able letter to the *Manchester Guardian* of July 10th, Mr. Ashworth is anxious to know where can the production of Lancashire be disposed of should the demand for India fall off. A small proportion may find its way to the other markets, as I have just shown, but the bulk will have to find an outlet elsewhere if the production is to keep up to its present rate. It will not be an easy task to discover immediately fresh or increased sources of demand."

The Umbrella Trade.

With the heavy rainfall we are having as we write this, a few details of the trade in that useful article the umbrella taken from our contemporary the *Commerce* may not be without interest. The striking feature is the steady decline which has been taking place in the imports during the last 20 years. One would have thought that with the improvement in the status and wages of the masses the imports would have increased, but while the umbrella is undoubtedly in greater demand than ever it was, statistics of the imports into Calcutta prove that the imported article is being almost entirely replaced by the "Swadeshi chatta." Whereas in 1891-92, the number of umbrellas imported into Calcutta from all countries was 4,684,125 rising steadily to 5,478,428 during 1893-94, there has since been an almost constant annual decline and during 1909-10 the imports dropped to 1,149,249 with a slight improvement to 1,250,462 during 1910-11, the latest years for which statistics are available at the moment. The supply from the United Kingdom which was no less than 4,318,831 during 1893-94 dropped to 735,546 during 1909-10 and was 795,059 during 1910-11. Curiously enough, imports from France which were 7,509 during 1893-94 rose to 36,764 during 1909-10, which shows that the demand for elegant umbrellas is greater than before. The imports from Japan rose from 1,320 during

1892-93 to 135,558 during 1903-04, since when they have declined to 3,403 in 1909-10, with an improvement to 7,271 in 1910-11. The Straits Settlements supplied no less than 995,740 during 1891-92 but 101,861 represents the total for 1910-11. The wily Chinaman has held his ground, the figure of 179,800 during 1891-92 being replaced by 282,703 during 1910-11.

It must be a source of satisfaction to the adherents of honest "Swadeshi" enterprise to realize that he has proved himself an adept in staving off 'foreign' competition in the supply of these goods to his brethren.

The Science of Shop-Keeping.

Shop-keeping is an art. Besides knowing when to buy and when to sell, the tradesman must know how to induce customers to purchase; he must advertise his wares, display them in conspicuous places, prevent imitations of them by others, and must be able to offer arguments and suggestions which would induce customers to possess themselves of the articles offered. Obviously a certain effect has to be produced on the mind of the purchaser. If the article is of undoubted value and has an established reputation, and is recommended by experts or those who have used it, no adventitious aids are necessary to improve its prospects in the market. Where the purchaser has not already made up his mind—and this is what happens in the case of most articles,—the tradesman must use all his ingenuity in making it acceptable before trial. The study of effects upon the mind falls within the province of psychology, and American professors have been busy investigating, in their laboratories, the conditions under which advertisements, exhibitions, the disposition of goods, the form of conversation and suggestion and other means which salesmen have to employ, succeed most in producing the desired effect upon customers. The object of advertisement is to make the people remember the advertised article and not always to secure for it immediate sale; a good advertisement therefore must produce a strong effect on memory. It must therefore be easily intelligible. The grouping of words and letters may sometimes be ingenious and fantastic and may be admired by the reader who has time to study it; but most readers have no time to study an advertisement which is not on the face of it clear enough to him. Size is an important consideration; but in a newspaper or magazine, the relative size, rather than the absolute size, tells. Thus a full page advertisement in a small magazine may have more psychological value than a larger number of square inches on a large sheet surrounded by other advertisements. Originality, unusual form, vivid colour, humour—all these produce an effect upon memory, and are hence of great value in the art of advertisement. Repetition is one of the most important factors; everyone knows how helpful repetition is to the memory and the object of repeated advertising is not so much to facilitate reference for price and other particulars; it is rather to prevent the article from slipping out of the public memory. All these propositions have been scientifically tested in psychological laboratories and much instruction has been derived from the experiments. Thus a professor makes a collection of a large number of advertisements from newspapers and magazines and arranges them in various ways. A number of persons, say fifty, are asked to turn over the leaves and write down afterwards what they remember. The entries are then tabulated and the result shows what impression each advertisement has produced on their memory. That which has been remembered by the largest number is evidently the most successful advertisement; that which has been remembered by a smaller number of persons is a less successful advertisement. By experiments of this kind, it has been found that the upper half of a page appeals to the memory more than the lower half, and the right half more than the left half. Perhaps experienced advertisers know many of these secrets, but it is something to have them scientifically investigated and confirmed. Moreover, science measures with some degree of accuracy the impression produced upon the mind, and this measurement must be helpful in fixing the price that is worth being paid for

an advertisement in a particular form, place or, colour. Beautiful figures are sometimes added to make advertisements attractive; Munsterberg's advice is that they should not be too beautiful: they should not divert the attention from the article to the object depicted. We often execrate the bad taste or the æsthetic shortcomings of a painting in an advertisement, but we must remember that if art is allowed to compete with commerce, the former will have the upper hand, and instead of the art assisting commerce, it will prove a dangerous rival. As has been said: "The very meaning of beauty lies in its self completeness. A really beautiful landscape painting is an end in itself and must not stir up the practical wish to visit the landscape which has stimulated the eye of the painter. If the display is to serve economic interest, every line and every curve, every form and every colour, must be subordinated to the task of leading to a practical resolution and to an action; and yet this is exactly the opposite of the meaning of art." The practical economic desire of the spectator should not be turned aside by the artistic excellence of the advertisement. It appears that some tradesmen in America attach so much importance to this combination of art with economics that they consult the professors on the most successful methods of combining them. One tradesman, for example, found that when the same kind of chocolate was sold under twelve labels, some of them were highly successful, while others were huge failures, and Munsterberg was asked to find out the reason. He does not state what answer he gave, but as a result of his experiments, he insists that there is always an "internal relation" between the picture and the article, and while in some cases a picture has a strong suggestive power, in others it creates a mental disturbance and has an inhibiting influence. Thus a picture which is unsuccessful with sweets may be eminently successful for tobacco; but the professor cannot explain why, and hence his science does not yet possess all the practical value which the tradesman may desire for it.

One of the most frequent annoyances, to which the life of a tradesman is subject, is the illegal imitation of his wares by rivals. The legal rule is that infringement of patent occurs when the marks, names, labels, or packings of one trader resemble those of another sufficiently to make it probable that ordinary purchasers, exercising ordinary care in purchasing the article in question, will be deceived. It is, however, not easy to determire in many cases by evidence whether or not an ordinary purchaser will be deceived. Professors of psychology are not without hopes that the probability of deception can be experimentally found out, and Munsterberg suggests methods whereby this object can be achieved. Imitations of the labels, for example, may be made in the laboratory and the effect of substitution upon the mind of a number of persons, say fifty, may be experimentally determined. When the psychologist develops his science to a sufficient extent, the law courts may consult him as an expert, just as they consult medical men, chemists, and other experts.

Turning to another branch of investigation, the qualifications which a salesman must possess in order to capture customers are so many, and some of them are of such an indefinable character, that the psychologist has not yet succeeded in determining them. Voice and movement, skill of suggestion, manners, firmness, and many other qualities influence the purchaser in a way which cannot be easily defined. Yet it is well known that one form of speech instead of another, used by a salesman, may result in unexpected consequences. It is said, for example, that in a certain shop the saleswomen used to ask "May we send it to you?" when a moderately large-sized article was sold. The customers were as a rule too lazy to offer to take it themselves and they yielded to the suggestion. Sending the articles to their homes was found very inconvenient, and the saleswomen were ordered to ask "Will you take it with you?" And, as a rule, the customers agreed to take the article with them and the shop was saved a great deal of expense and trouble. The influence of suggestion is almost mesmeric, though one does not

speak of the mesmerism exercised by salesmen and by saleswomen. But everyone knows that a good deal of occult influence is nevertheless exercised over customers, especially by saleswomen.—*Indian Spectator*.

Artificial Silks and How to Tell Them.

Mr. W. P. Dreaper, F.I.C., Honorary Consulting Chemist to the Silk Association of Great Britain and Ireland, writes to the *Times* at the instance of the President of the Association representing that the artificial products which are prepared from cotton or wood-pulp by actual solution in certain chemical solutions with subsequent spinning operations should not be described as silk or be sold under that title, which would imply that they were in every way equal to the natural product, which is far from the truth "A recent series of prosecutions by the Board of Trade at the instance of this Association," he writes, "has definitely settled this point in law. The suppression of these artificial products is not aimed at, but the public must not be led to think that they are the equivalent in value to the natural product. The point is that artificially prepared yarns or fabrics, which are of vegetable origin, should not be described or sold as 'silk.' Legislation has even been suggested in France to prevent any material being sold under the title of 'artificial silk,' owing to the implied suggestion in the use of the term 'silk.'"?

The above warning is issued none too soon in our opinion. For, as pointed out by the *Chemical Engineer*, artificial silk is fast coming to be a very important textile material and is being used in ever increasing quantities by the trade. It is employed as an adjunct not only to the silk industry itself but is also being used in connection with wool and cotton in the preparation of a great variety of fabrics. It is even being used largely in knot goods and hosiery in combination with cotton and mercerized cotton.

The dyer therefore is meeting more and more with this product, and as there are three different kinds of artificial silks in general use, and as these different varieties possess certain differences in structure and quality, it really becomes a question of considerable importance to the dyer to know one variety from another. This is more especially important because one silk may stand a treatment which would be fatal to another.

The three artificial silk now to be met with on the market are described in a recent issue of the *Wool and Cotton Reporter* as follows :—

(1) Collodion silk, known as Chardonnet, or nitrosilk. It is prepared from nitrated cotton.

(2) Cuprate silk, known as Glanzstoff, Pauly Elberfeld silk. It is prepared from a solution of cellulose in cuprammonium solution.

(3) Viscose silk. This is prepared from a solution of cellulose in a mixture of caustic soda and carbon bisulphide.

In their outward appearance the three forms of artificial silk are so nearly alike that it would not be possible to distinguish between them. Even a microscopic examination by an experienced observer does not lead to any positive conclusion as to the kind of silk.

A fairly simple test, however, according to *Paper*, and one which may be easily carried out by the average dyer, is the following : A sample of the silk to be tested is placed in a small porcelain dish and concentrated sulphuric acid is poured over the fibres. If the sample consists of collodion silk, no coloration appears until about an hour has elapsed, when the acid solution will acquire a pale yellow color.

In the case of cuprate silk the acid becomes yellow immediately, and the color becomes deeper on standing.

In viscose silk the acid immediately develops a reddish brown, deepening to a rusty brown.

Commerce and India's Future.

Mr. G. S. Bhargava, F.C.I., F.C.T., contributes an article on the "Importance of Commerce and India's Future" to a recent number of the *Hindustan Review*. "Self-Government for your country largely depends upon its commerce," is the keynote of the article.

What in reality subjected the Indians to foreign rule is, in the writer's opinion, the too easy hold that India presented to the Britisher, emaciated as she was, by previous Mahommedan plunder and invasion. The writer says that it was simply through the medium of commerce that the British nation is to-day the Supreme Government of India.

The people of India have not felt any needs at all beyond the one permanent necessity of gaining the means of life. The difficulties under which the Indian manufacturers labour are as follow:—

The first and the great disadvantage is our own insufficient voice in the present Government which is at liberty to levy taxes, to create Factory Acts and to suffer our corn to be exported in abundance at the time of dire famine devastating our own country. These and such like things the British Government does, and more often than not, in the very teeth of popular opposition. Besides this, the average Indian is almost uneducated and ignorant and Mr. Gokhale's great Elementary Educational Bill which aimed at the propagation of education of the masses has, to the disgust of the nation, been recently thrown out. It is certainly the duty of the Government to better educate the masses. For education, if it is not the panacea of all social and political evils is at least the main condition of a nation's commercial greatness. But it is not only the Government who is to blame, our own country-men are also great sinners. For instead of encouraging our own manufacturers, they patronize foreign goods even though their various wants could be as well satisfied by indigenous products. But the remedy lies as much with us as with the Government. What we require is, that factories and manufacturers should be multiplied a thousand times more than what we have got to-day : we require to manufacture even from the smallest thing, needle, to the biggest thing, machinery and engines, in our own country ; we require honest workers and self-sacrificing people, and last though not the least, we require the hearty encouragement of our own country-men and then the dawn of self-government will only be a question of time.

Tobacco Trade.

The statement below shows the tobacco trade of India with foreign countries by sea and land, and is self-explanatory :—

—	—	Imports of tobacco into India from foreign countries *by sea.*	Imports of tobacco into India from foreign countries *by land.*	Exports of tobacco from India to foreign countries *by sea.*	Exports of tobacco from India to foreign countries *by land.*	TOTAL.	
						Imports.	Exports.
		cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
Average of 2 years ...	1879-80 & 1880-81.	11,105	18,362	112,084	37,644	29,467	149,728
" " " ...	1889-90 & 1890-91.	14,605	42,172	67,486	63,309	56,777	130,795
" " " ...	1899-1900 & 1900-01	31,864	34,434	71,121	110,016	66,298	181,137
Single year	1907-08	56,300	37,787	189,177	67,711	94,087	256,888
" "	1908-09	49,619	45,909	106,729	75,846	95,528	182,575
" "	1909-10	65,434	45,813	109,368	61,040	111,247	170,408
" "	1910-11	16,099	53,902	174,588	78,641	70,001	253,229
" "	1911-12	19,686	46,244	254,401	101,910	65,930	356,311
(Calendar year.) ...	1912	19,491	54,417	206,195	101,785	73,908	307,980

Openings for Business.

[For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle]

PATTERN SHOP SUPPLIES.

A Birmingham firm is desirous of communicating with buyers of pattern shop supplies or with parties willing to act as their agents in India. (C 94)

GOATS HAIR.

A firm in Trieste is desirous of communicating with shippers of goats' hair. (C 95)

BONES.

A Philadelphia firm is desirous of communicating with shippers of animal bones suitable for the manufacture of buttons. (C 96)

EUCALYPTUS OIL.

A London firm is desirous of communicating with distillers of eucalyptus oil. (C 97)

MOROTTY NUTS.

A Cochin firm is desirous of communicating with local buyers of marotty nuts (*Hydnocarpus wightiana*) (C 98)

TEA, INCENSE AND CINNAMON.

A firm in Greece is desirous of communicating with shippers of tea, incense and cinnamon. (C 99)

FRUIT.

A firm in Secunderabad is desirous of communicating with sellers of fresh fruits in India. (C 100)

CASHEW NUTS, COFFEE AND TEA.

A merchant in Trieste is desirous of communicating with exporters of cashew nuts, coffee and tea. (C 101)

COCHINEAL.

A Liverpool firm is desirous of communicating with buyers at Calcutta, Bombay, Madras, Karachi and Rangoon of cochineal. (C 102)

CIGARS.

A firm in Alexandria is desirous of communicating with exporters of cheap Indian cigars. (C 103)

GUM, INCENSE AND PERFUME.

A merchant at Marseilles is desirous of communicating with Calcutta exporters of gum, incense and perfumes. (C 104)

LEAD-ORE.

A merchant at Marseilles is desirous of communicating with Calcutta importers of lead-ore. C (105)

SISAL HEMP.

A London firm is desirous of communicating with exporters of sisal hemp (*Agave sisalana*). (C 106).

TILES.

A firm in Hereford, England, is desirous of appointing Agents for the sale of encaustic, tesselated, glazed, plain and antique enamelled tiles, hand-painted panels, tile hops, etc- (C 107)

ROSIN AND TURPENTINE.

A Forest Officer in India is desirous of communicating with (*a*) importers of American rosin and turpentine in Calcutta, Bombay and Karachi; and buyers who require annually at least 5,000 gallons of turpentine and 1,000 maunds of rosin. (C. 108)

INDIAN BUTTER TREE SEEDS.

A merchant in Scotland is desirous of communicating with sellers of seeds of the Indian Butter tree (*Bassia butyracea*). (C 109)

OILSEEDS, HIDES AND SKINS AND GUTS.

A merchant in Trieste, Austria, is desirous of appointing Agents for the sale of oilseeds, hides and skins and guts. (C 110)

RUM.

A firm in Massachusetts (U. S. A.) is desirous of communicating with importers of New England Rum, known also as Boston White Rum. (C 111).

OIL MILLS.

A Consulting Engineer of Liverpool, whose services could be utilized in designing, erecting and obtaining tenders for machinery, is desirous of getting into touch with firms who are contemplating the erection of new or the extension of existing oil milling and extracting machinery. (C 112)

The Economic World.

Price Variations in New Zealand.

In the *Economic Journal* for September, Mr. J. W. McIlraith, has an article on the above subject. His conclusions may be briefly stated thus:—

First, that variations in the price-level in New Zealand are due only partially to causes purely local, but since they coincide remarkably with variations in the price-level of other countries, notably of England, Canada, and the U.S.A., they must be due in great degree to causes of world-wide operation; and secondly, that while a period of falling prices of goods of local production spells commercial instability and social gloom, a long continued period of rising prices of such products means exceptional commercial stability and social enthusiasm.

Famine Relief in India.

Mr. D. A. Barker writing in the *Economic Review* (Quarterly) for July 1913 points out that owing to the rapid development of transportation facilities, which has been, perhaps, the most important feature in the progress of the human race during the last hundred years, the occurrence of a "famine" in the strict sense of the word has become almost impossible. Recent writers on Indian subjects have begun to draw attention to the fact that the distress caused by "famines" in the country is due not so much to the absence of food as to the absence of work. A famine, in fact, is a period of widespread unemployment.

The development of famine relief in India has arisen from a clear realisation of this idea —that the famine is a period of unemployment —together with an ever-growing comprehension by the Government of their duty to relieve the unemployed.

Does the natural increase of India's vast population imply a more frequent occurrence of famine—an ever-increasing expenditure of public money combined with an ever widening circle of distress? Or will the march of events bring about a *conjunctur* in which famines will be less frequent and less severe or even altogether unknown? Time alone can give the complete answer to such questions as these, but there are indications which may be noted here

To begin with, there is the large and increasing growth in the number of landless labourers. The amount of land available for cultivation is fixed and the process of sub-division has gone to its utmost limit, so that any increase in the population almost necessarily involves a corresponding increase of the landless class. It is upon this class that the burden of famine falls most severely. Though in prosperous times the labourers are often as well to do as the petty landholders, yet they have no store of food to put by for times of scarcity, so that every change of prices is to them of vital importance.

When the rains hold off and the petty farmers postpone the operations of agriculture, the labourer is deprived of his livelihood at the very time that *prices* have begun to rise.

In itself, therefore, this increase in the number of landless labourers is a serious feature the only cure for which will be a great extension of manufactures and other industries of a type which cannot be brought to a complete standstill by mere failure of rain.

And there is little doubt, that this cure will make itself felt before long. Already the mills of Bombay and Calcutta give constant employment to a large number of men, while there are signs of industrial expansion in all parts of the country. It has frequently been suggested that adoption by India of a tariff, protective against foreign competition with Indian industries, would be equally protective against famine. Apart, however from the increase of the purely labouring classes which must always be a potential danger, practically every other phase of economic development in India seems to help towards making famine less frequent and less severe.

Efficiency of the People.

One of the very best portions of Mr. Visweswarayya's address to the Dasara Representative assembly is that in which he discusses the measures for improving the capacity of the people. We make no apology therefore for extracting it in our columns.

"It is not difficult nowadays to construct public works, railways, tramways or other works, because skilled agencies can be imported for the purpose. Foreign capital can be obtained if we are able to guarantee a fair return on the outlay. It is also easy to man the public service with the best talent available in India, or, for that matter, of the world, because there is an abundance of such talent seeking employment. The help of outside agencies which, while benefiting themselves, are also likely to benefit us, should be welcomed. But large enterprise carried out entirely with outside help will not increase the capacity of our people or raise the status of the country. And, unless in the fiscal and geographical area known as Mysore, the intelligence of the people, the natural resources and the available capital act and re-act on one another, and with cumulative effect, the country cannot be said to be making any permanent progress.

There are certain features in our present condition which necessitate anxious watchfulness on our part. The country has no doubt progressed within the past 30 years. People are better housed, better clothed and normally better fed, and the average standard of living has also risen ; but the advance in these directions is due to the general progress of the Indian continent, as a whole, rather than to any organized activity or design on our part.

Only one person in every sixteen is able to read and write. The cultivators are not fully occupied even in normal seasons ; in years of scarcity, for months at a time, they are left without occupation and without hope. Three-fourths of our population are dependent on agriculture and the great bulk of them live in villages without activities or aspirations outside their individual households Our landowners are small men, our business is conducted by small traders and artizans, each working singly for himself. The lessons of co-operation and organization have not permeated even the top strata of society.

The first Dewan since the Rendition, with the experiences of the famine of 1876-78 fresh before him, drew attention to a similar state of things then. In his address to this Assembly in 1881, Mr. Rangacharlu strongly urged the need for industries and industrial development. remarking "that no country can prosper unless its agricultural and manufacturing industries were equally fostered."

He was also of opinion that "when all the world around is making marvellous progress, the 200 millions of people in this country cannot much longer continue in their long sleep simply following the traditions of their ancestors of 2,000 years ago and earning a miserable subsistence, ready to be crushed on the first occurrence of a famine or other calamity."

These words are as true to-day as they were when they were uttered thirty years ago and unless a change is attempted, they will continue to be true thirty years hence.

"It is not Governments or forms of Government," remarked His Highness the Maharaja in a speech delivered so far back as 1903, "that have made the great industrial nations but the spirit of the people and the energy of one and all working to a common end."

Following the lead of His Highness, we must develop the life and capacity of our people by encouraging in them self-help, power of initiative, courage to change, courage to create new things, spirit of co-operation and a capacity for organization.

Reasonable scope for the co-operative effort of the people in the State is provided for, however imperfectly it may be at present, by the organization known as the Economic Conference ; and no one who has witnessed the educational activities, the roar of industry and the keen competition in trade, that is going on in the advanced countries of the West, can fail to sympathise and co-operate with the objects of that movement.

The organization is intended to stimulate

co-operative enterprise in cities and towns and gradually among the rural population; but since nine-tenths of the people live in villages, it appears to me that a special effort is necessary to stimulate economic activity in rural areas.

The village forms a convenient unit for purposes of economic effort, for taking stock of progress at the beginning and end of a year. If each village shows a little improvement, from year to year, the collective result will be large. No village should be considered as maintaining a fair standard of enlightenment which does not keep 5 to 10 per cent. of its population under education. No village should fail to subscribe to one or two well-conducted vernacular newspapers, to keep itself informed of what is going on in the outside world. Every village family should be induced to keep in reserve grain or money sufficient to tide over a famine of two years. No cultivator's family should be without a subsidiary occupation to provide the members with the means of livelihood when agricultural operations are slack, or are stopped during scarcity or famine. Every village should show some public improvement or other as the result of the collective effort of its inhabitants at the end of each year.

The villages may be called upon to publish once a year a few essential statistics of their economic growth. And as the great bulk of our population live in villages, any effective organization to improve village efficiency cannot fail to make a potent addition to the life force of the people and the productive power of the country."

Thoughts about Prices.

A writer in a recent issue of the "*Times of India*" offers some very useful remarks on the above subject.

It is generally agreed that the increased cost of living in all civilised countries is one of the most pressing problems with which humanity is confronted. Before one tries to get at some of the reasons behind high prices, it will be well to have a perfectly clear idea of what we mean by such terms as Price and Value. Value means what a thing is *worth* to the person who wants it or to the person who has possession of it. Price means the sum of money the possessor of a thing can obtain for it from others in competition with other holders of the same commodity or thing. One can only discover the real purchasing power of money by ascertaining what quantities of commodities, etc, any given coin or any given number of coins will exchange for.

A few of the causes which affect prices are:—

(1) Increased facilities for world transit.
(2) Gold production.
(3) Good or bad harvests.
(4) Speculative manipulation of the supply of raw materials.
(5) Trusts, combines, etc.
(6) Advance in wages.
(7) Strikes, Labour Disputes.
(8) Growth of population.
(9) Rise in Land values.
(10) Expenditure on armament.
(11) Rise in standard of living.
(12) Increase of luxury.
(13) Taxation.
(14) Increase of instruments of credit.
(15) Supply and demand.

The tendency of nearly all the foregoing causes is to force prices up. The most potent causes for bringing prices down are abundant supplies and improvement in manufacturing machinery and methods. The growth of population tends to raise prices both of land and commodities. That the increased facilities for world transport constitute one of the chief causes for the rise in prices in thousands and thousands of areas is certain.

In this great price problem, there are two or three points which must never be lost sight of. First of all, it is worth remembering that the rise of prices in the last decade or 12 years is by no means an unprecedented phenomenon. The second consideration is that, although there has been a great advance in the wholesale and retail prices of food stuffs, etc., since 1900, many commodities are cheaper and

some necessaries of life are now below the price which ruled in certain years between 1900 and 1911. The chief and most logical reflection is that it appears highly probable that the prevailing discontent regarding prices is really based not so much on actual scarcity of cash to pay for the necessaries of life, but rather on an evergrowing demand for material adjuncts to existance which are held now to be indispensable with our more exacting luxurious, and indulgent standard of living.

Economic Position of India.

India is talked of as a prosperous country, but, says the *Leader*, it is Anglo-India to which the observation applies with more truth than to Indian India. It is not denied that certain sections of the population have become more prosperous under the conditions brought into existence by the British Government, but the mass of the population has not shared in the prosperity. It may be a controversial question whether with years the poverty of the people is growing more acute or less so, but it is a fact that the people are very, very poor and hardly able to make both ends meet. Even as regards the well-to-do classes, they would not be regarded as well of in any of the wealthy western countries : their resources are comparatively so limited. A man with Rs. 50,000 passes almost for a rich man in India, but one with £3,000 or £4,000 in England is not at all regarded as such. How much better off than Indians are Englishmen, man for man, is shown by the striking disparity between their average annual incomes per head, being £40 in the case of Englishmen and at the most £2 in the case of our countrymen : a fact which is apt to be overlooked by official defenders of the taxes imposed on the people of India by the Government.

The Indian Offer of Imperial Preference.

Tariff Reformers in England too often forget the interests of India, in their discussion of the adoption of a Tariff wall to protect their own Home industries. They want to maintain the open-door policy in India. But they have a different set of arguments when protection for their own interests is involved. Indian public opinion has repeatedly condemned the fiscal and economic policy imposed on us by the British rulers. "Is there no way in which the interests of India and the requirements of its public opinion can be reconciled with the interests of the United Kingdom, and the development of India's resources be made both to serve and be served by the development of the Empire as a whole?" That is the question that Sir Roper Lethbridge has set himself to answer in the book before us on "The Indian Offer of Imperial Preference." We hope to examine the author's views later, contenting ourselves now with the remark that the book is a timely publication when the economic conscience of India is sought to be roused by a free examination of the financial management of the India Office by the Royal Commission that is now sitting and by the Institution of a Commercial Congress as proposed by the Hon'ble Mr. Currimbhai.

Mr. Austen Chamberlain writes an introduction and Messrs. P. S. King Son are the publishers. The book is priced at 2*s*. 6*d*. net.

The State as Landowner.

In the "Introduction to Hindu Polity," contributed to a recent issue of the "*Modern Review*," by Mr. K P. Jayaswal, B.A., (Oxon.), Barrister-at-Law, we find some striking paragraphs bearing on the above subject. Mr. Jayaswal observes:—

"Some English writers have confidently asserted that property in the soil always vested in the Hindu sovereign. This is as great an error as to describe the Baltic as a desert in Mongolia. The writers unconsciously have read their own feudal law in Hindu jurisprudence. Nothing is so distant from Hindu Law as this theory. Any one who is conversant with the general tendency of the principles of Hindu Law in constitutional matters would not believe his eyes even if he is given a Shloka in support of the theory. Numerous instances of gifts and sales of land by private individuals can be given from the

earliest literature. Law-books give provisions for sale of land and for acquirement of proprietory right by prescription. Inscriptions proving to the hilt private property in the soil are extant. Above all it is expressly and emphatically declared that the king has no property in the soil and this is declared in no less a place than in the very logic of Hindu law, the Mimamsa, the authority of which in legal matters is supreme. I give below the discussion from Colebrookes' essay on the Mimamsa :—

"A question of considerable interest, as involving the important one concerning property in the soil in India, is discussed in the sixth lecture. At certain sacrifices such as that which is called Viswajit, the votary, for whose benefit the ceremony is performed, is enjoined to bestow all his property on the officiating priests It is asked whether a paramount sovereign shall give all the land, including pasture ground, highways and the site of lakes and ponds, an universal monarch, the whole earth, and a subordinate prince the entire province over which he rules. To that question the answer is: The monarch has not property in the earth, nor the sudordinate prince in the land. By conquest kingly power is obtained, and property in house and field which belonged to the enemy. The maxim of the law, that "the king is the lord of all excepting sacerdotal wealth, concerns his authority for correction of the wicked and protection of the good. His kingly power is for government of the realm and extirpation of wrong; and for that purpose he receives taxes from husbandmen, and levies fines from offenders. But right of property is not thereby vested in him."

Jewellery in India.

Mr. K. Raja contributes an article on the above subject to a recent number of the *Hindustan Review*.

After pointing out that the desire for some form of personal ornamentation is as old as history itself, the writer points out that in India this desire has taken extreme forms. He descants on the evils arising out of an immoderate investment in jewels. He is, however, careful to point out some beneficial purposes for which jewels are used. He concludes by expressing his disapprobation of the present craze for jewels in India.

The following is a brief summary of the article :—

That jewellery should be one of the objects on which the love of the people should be lavished is no great wonder, for the history of jewellery takes us back to the earliest beginnings of human history. We know from authentic sources that there were many kinds of jewels in Greece, Rome, Egypt, and Assyria.

In India, the passion for jewels is very great.

"In short, it is no exaggeration to say that it is nothing less than a craze in India among women-folk. Jewellery forms also an ordinary mode of investing money. In a country like India where banking is unknown, or is at best in infancy, recourse is frequently had to this method of investment, which is not subject to the same risks as others."

In the writer's opinion, there is ample reason for the cry that the sovereign does not circulate in India.

Sovereigns always sell at a premium in South India and the run for them is so great that scarcity is very often felt. The gold coin that passes into the hands of a housewife does not see the light of day again until it is melted and converted into a jewel. The recesses into which it finds its place do not yield it up except on occasions of grave emergency, and to the very last moment it is not surrendered up. How then can we expect gold coins to circulate freely ?

The evils arising out of an immoderate investment in jewels are too obvious to require argument. To say nothing about the barbarous system of perforating the body and disfiguring the natural comeliness by hanging grotesque jewels therefrom, there are other economic evils which seriously hinder the material progress of the country.

One can clearly perceive how the investment of money in jewels arrests further circulation

and further investment, and how the money so treasured up becomes "hoarded wealth" in the true sense of the word. It becomes "dead capital," to use a familiar phrase; it ceases to breed money as it ought naturally to; it is not continually manured and fructified. One of the means by which the material prosperity of the country is augmented is cut off.

The result is that, unless the Indian purse-strings are loosened, foreign capital will be showered in more by too ready hands, and with it would come foreign dominion also.

And all this because the Indian capital that should have been rightfully employed is sleeping, is not ready to appear when the call goes forth. The bias of the nation should be a passion for utility. A man fails in his duty to the country, unless he adds something to the common wealth, and unless the resources at his disposal are placed before the needs of the country. He is the rich man in whom the people are rich and he is the poor man in whom the people are poor.

The beneficial purposes for which jewels are employed in Southern India must not be entirely neglected. They form the last resource for raising money on their security. Again, jewels also appear to be one of the modes in which provision is made for Hindu women. We can see how those benefits arising from jewellery contribute to the expensive use of jewels in India. But India is rich in land and labour and her natural resources await only the key of capital to open the same. If therefore the capital now imprisoned in diverse centres be liberated and utilised in the production of wealth, we may hope for a millennium in the near future.

Fixing Prices.

The theory and effects of the laws of supply and demand, which philosophical writers of a past age enunciated with a considerable degree of confidence, have not been found to operate by the practical experience of the present age with that degree of absolute directness which students of the subject claimed for them. An abundance of supplies of any commodity was considered advantageous for the consumer, as it was presumed to bring about a fall in prices. Contrariwise a scarcity of supply was presumed to raise prices. Consequently a free and full supply of all that the consumer needed was considered the surest means of securing low prices for his benefit. In spite, however, of abundant free supplies of the principal necessaries of life, from all quarters of the globe, prices have not fallen but have, on the contrary, perceptibly risen. The theory as to the operation and effects of the laws of supply and demand, is put forward by writers on political economy, appears to have altogether ignored the existence of the middle man, the agent, or broker, and to have assumed that supplies were immediately and directly offered to the consumer; and that the consumer when he experienced a scarcity immediately applied to the supplier and that there were no intervening stages in the transactions between supplier and consumer or consumer and supplier.

In the first place the consignee, agent or broker, generally described as the middle man, will be found to be a most important factor in deciding what price the consumer shall pay for the supplies entrusted to him for realisation. In the case of any standard article of food shipped from foreign countries and consigned to an agent or broker in London, there may be many cargoes of the same article and of a similar quality shipped by different owners to different agents or brokers in London, but these different shipments, though comprising a large quantity in the aggregate, will not bring about any appreciable fall in the price of that particular article. The leading agents or brokers in the market will not immediately commence to compete against each other by selling at low prices, in order to effect a sale, but will meet together and fix the price, varying according to quality, at which they should all sell, and in this way the average market price is maintained. Consequently all the foreign shippers of that particular article receive somewhat about the same price or the equivalent price according

to quality, and watching the London prices from day to day they are able to judge whether they are being fairly treated by the agents or brokers to whom they consign their goods.

It is true that, in the case of auction sales, competition effects better results especially where buyers attend from different foreign countries, but a large majority of articles imported are not sold in this way. It is strange that with the ever increasing shipments of fruits and dairy produce from Australia, the United States, New Zealand and Tasmania the consumer sees no lowering of prices. The consignor of fruit or dairy produce from the self-governing Dominions receives a similar treatment to that accorded to the home producer who consigns his produce to be sold by the provision-broker, fruit-broker or fish-salesman. To whichever market the produce belongs, the price at which it is offered to the buyers, whether wholesale dealers or retailers, is not arrived at by open competition but fixed by the leaders of the market. In the case of articles which can be kept in cold storage, such as frozen meat, butter, &c., it is obvious that any abundance of supply need not affect prices, as the goods can be kept until it is considered advisable to realise.

It will be seen that imported goods must pass through at least three hands, *viz.*, the agent or broker, the wholesale dealer and the retailer, before reaching the actual consumer, and each has to make a profit on the original or shipper's price. It has been shown that there is little or no competition which would effect any lowering of prices at the stages previous to reaching the retailer. As the retailers must all buy from what is practically the same market, they all purchase at very much the same price. We have now to ascertain whether there is any competition amongst the retailers which is likely in any way to bring down prices. Most retailers fix their prices for most articles more with regard to what the public have been accustomed to pay, than in relation to what the article has cost them. Most retailers in the same neighbourhood sell very much at the same prices, and the public continue to pay the prices they have been accustomed to, and, if anything, a higher price.

The retailer has year by year to face increased rentals. His local rates are continually increased for many and various purposes, and his additional expenses have to be recovered from his customers by keeping up the prices of what he retails. A large number of Local Boards of all descriptions are spread over the country, and those meet to discuss new sehcmes of improvements in roads, drainage, education, tramways, model dwellings, &c., the cost of which is all charged on the rates. The annual burden of all this, which consists of repayment of loans, and payment of annual nterest on loans, constitutes a huge annual tax, which is practically an annual tax on the necessaries of existence, and this in a large measure accounts for the continual rise in prices. Local rates when first imposed were assumed by ingenious theorists to be different to taxes; but, after 50 years of experimenting and accumulation of debt, it is beginning to be realized that, after all, any additional annual cash payment imposed on any citizen, call it by whatever name you please, for which he receives no tangible or visible return is nothing more or less than a tax.—*Paper Makers' Monthly Journal.*

American Agricultural Commission.

Our readers are doubtless aware that an inquiry is being made on the Continent, and in the United Kingdom, into the organisation of agriculture by a large American Commission, including among its members delegates from most of the States of the Union and from one or more of the Provinces in the Dominion.

Sir Horace Plunkett thus describes the genesis of the Commission in the *Economic Journal* for June—

Towards the end of Mr. Roosevelt's administration a wave of new thought upon the social condition and economic needs of the farmimg population swept over the United States. Its growth was stimulated by the Conservation movement, the aim of which was to call public attention to the reckless waste of the natural resources of the country

by exploiting capitalists, and to promote legislation to restrain it. In the course of the discussion it was frequently pointed out that by far the greatest national waste was to be found in the depletion of the fertility of the soil. Already the effect of bad husbandry was seen in the declining exports of agricultural produce. In the next few years, unless some radical change takes place, the United States will have to import some of its staple foods. The rising cost of living—the most vital question of the day in that country—is attributed by many to a faulty agricultural economy, the chief defect of which is the total lack of business organisation amongst those engaged in producing the nation's food. This advantage, under which these workers labour, is accentuated by the high degree of perfection attained in the organisation of other American industries, since in their mutual transactions organised interests prey upon the unorganised. Upon an unsound economic foundation no prosperous social life can be built up.

Whatever may be thought of such generalisations, it cannot be denied that, despite its unique physical opportunities, American agriculture, both as a social and as an economic force, is unnaturally and unnecessarily depressed. The thinkers of the towns are becoming more and more alive to their ultimate dependence upon the welfare of the farmers, and for the first time since the industrial revolution public opinion is beginning to give to agriculture its proper place in the national economy. This is, I think, a substantially accurate description of the state of facts which was held to need the serious attention of thoughtful men in the United States.

The first serious attempt to initiate a scheme of rural betterment was the appintment in 1908 of the Country Life Commission. This body held sittings to which all and sundry were invited to come and give evidence as to local agricultural conditions, in almost every State in the Union. They published a report which did not immediately lead to action, but set people thinking. The daily Press and the popular magazines took up the "back-to-the-land" cry. The Federal Department of agriculture, the university and agricultural colleges, the churches and many other agencies of social progress, agitated questions of rural economy with increasing activity.

In April of last year an important and representative convention was held at Nashville, Tennessee, under the auspices of the Southern Commercial Congress—an Association of public men drawn by sixteen of the Southern States. Persuaded, I think it may be said, by the eloquent advocacy of Mr. David Lubin, the United States delegate to the International institute of Agriculture in Rome, those present came to the conclusion that a reform in agricultural credit would practically solve all the serious difficulties which beset the farmer. The resolutions adopted at this convention called for the appointment of the Commission, for which the United States Senate subsequently bespoke diplomatic courtesies abroad.

The movement grew in popular favour. Each of the three parties in the presidential campaign included agricultural credit as a prominent part of their constructive policies. On December 7th, President Taft convened a meeting of Governors at the White House to discuss the project, at which it was decided to commend it to all the States. The appointment of delegates thereupon commenced, and the Southern Commercial Congress set about making the arrangements for the European tour.

Meanwhile economic thought, aroused by a state of facts above indicated, progressed rapidly, and a mere inquiry into agricultural credit no longer satisfied those who had adopted the new conception of the proper place for the country's basic industry. Moreover, the popularity of the project was being threatened by doubts, expressed in many quarters, as to whether agricultural credit—a highly technical subject on which there is abundant and excellent literature—was one which could be hopefully investigated by such a body as was proposed in a summer tour. It was therefore decided by the Southern Commercial Congress to instruct the Commission, instead of treating agricultural credit as the dominant, if not the only, factor in the development of rural life, to inquire into and report upon the entire organisation of the farmers business in the countries to be visited. This change of procedure was approved by Mr. Taft, the then President, and was strongly endorsed by President Wilson and ex-president Roosevelt.

The Financial World.

State Bank for India.

The following is a special summary made for the *Wealth of India* of the evidence tendered by the witnesses before the Indian Financial Commission on the question of a State Bank for India.

In his memorandum presented to the Royal Indian Currency Commission, Mr. L. Abrahams, C.B., Assistant Under Secretary of State for India, set forth at length the considerations for and against the establishment of a State Bank. The probable advantages of such a Bank are—

(1) The whole, or a part, of the money that is kept under existing conditions in Reserve Treasuries, and possibly a part of what is now kept in District Treasuries, would be deposited with the Bank and thus placed at the disposal of trade with the prospect of a beneficial effect primarily on discount rates and ultimately on the general course of trade and industry.

(2) The Bank would be an ideal agency for lending money at certain times from the Paper Currency Reserve, if such a practice is introduced.

(3) The London office of the State Bank would undertake the sale of Council Bills and Telegraphic Transfers, such sale of them by the Secretary of State as now arranged being outside the ordinary sphere of a Government office.

(4) There would be a reduction of the cash balance held by the India office and consequently of the work and responsibility undertaken by it in connection with the placing of money on loan or deposit.

(5) The Government might borrow from the State Bank instead of issuing a loan.

(6) The Government would derive a pecuniary advantage from its share in the profits of a State Bank.

The disadvantages of a Sate Bank and the arguments against its establishment are—

(1) The Government of India and the Secretary of State by surrendering the custody of Government money to a Bank to a greater extent than now, might experience difficulty and delay in obtaining it when required.

(2) The advantages mentioned in (1) and (2) could be obtained to a considerable extent without the agency of a State Bank by an extension of the present practice of placing part of the reserves and balances on deposit with the Presidency Banks.

(3) The amalgamation of the three Presidency Banks into one State Bank, with its head-quarters presumably at Calcutta, would curtail the independence and responsibility of the Presidency Banks and it will be remote from the markets of Bombay and Madras.

(4) Differences might arise as to the relation between the London office and the Head office of the State Bank in India, regarding the sale of remittances in India.

Questioned if the Exchange Banks would not object very strongly to the State Bank being allowed to do exchange business, Mr. Abrahams replied that they would, if the State Bank bought export bills in order to get money in London and then bought import bills to send money back again, thus going in for exchange business ; but they would not object if the State Bank would do what the Secretary of State now does.

Mr. Lionel Abrahams stated in his examination that a large amount of Government control and co-operation is necessary in the management of the State Bank and, in his opinion, no unofficial agency could be thought of as a substitute for it.

Mr. Bhupendra Nath Mitra, C.I.E., Assistant Secretary to the Government of India, Finance Department, stated that it would be

possible for a State Bank to relieve the Government of all responsibilities as regards currency and banking.

Mr. L. G. Dunbar, Secretary, and Treasurer to the Bank of Bengal, opined that there would be great advantages to India from the creation of a Central Bank. Money would be cheap and what is now being locked up by Government under various names, would be available for trade. He put it down that the duties of a State Bank should be bankers to Government, to manage the Public Debt, the Paper Currency, the Gold Standard Reserve and to establish a London office in order to take away the banking business now done by the India office. Mr. Dunbar advocated the amalgamation of the three Presidency Banks as their relations at present are friendly. He further stated that there was not much enthusiasm about a State Bank in India, as the question has not been much brought before the public. It was a *sine qua non* to locate the Central Board of the Bank at Calcutta, because, he said, it was the most important town in India in the richest and most prosperous district. He maintained that the Government should be strongly represented on the Board of Directors.

Mr. James N. Graham, representing the Bombay Chamber of Commerce, was not in favour of the State Bank doing exchange business, except that part of it done by the sale of Council bills. Asked to criticise the management of finances supposing it were decided not to establish a bank, Mr. Graham said that it seemed to him that what the Indian Government wanted in India were bankers rather than a bank of their own. The Government had certain disbursements to make; they had their ordinary disbursements and disbursements for the purchase of silver and for creating, what might be absolutely essential and necessary, a Reserve Fund. These were all disbursements which the Government had to make or provide for, and it seemed to Mr. Graham that that could be done by a bank more legitimately than by Government officials. Mr. Graham stated that at present Government were money-lenders; but if a Bank were established, they would not be so, for there would be an institution to do the work. In Mr. Graham's opinion, the natives of India would have sufficient confidence to entrust their hoards to the State Bank.

Sir Daniel M. Hamilton of the Bengal Chamber of Commerce when questioned, did not see the necessity for a State Bank. The internal trade of India should be financed but it did not matter whether it was financed by the State Bank or the Presidency Banks. The Presidency Banks could take up the task of helping the Indian trade and, in his opinion, it should be done. Apart from that, he did not know why a State Bank was wanted.

Mr. W. B. Hunter, Secretary and Treasurer to the Bank of Madras, expressed himself strongly in favour of a State Bank for India. He regarded the reserve treasury system as one of the causes of the periodical stringency of money in India. It was to remedy this condition of things that Mr. Hunter proposed to have a Central Bank which should hold all balances of the Government of India and of the India Office. Such a bank, in his opinion, would have much greater credit and with a London Office could in times of stress be in a position to raise further finances. The establishment of a bank would do away with the trouble as to where the balances of the Government were to be located. He said that it would not matter whether the balances were with the London office of the Bank or with the Calcutta office, because they would be available in the reserve of that bank and would enable it to finance more trade. The bedrock of the position that Mr. Hunter took up was that money would be available for trading requirements to the public through the bank more readily. The lending out of the balances or a part of the fiduciary portion of the Paper Currency Reserve, though it would secure equal advantages, would not have the same effect, in his opinion. That would mean long correspondence before the money was made available for trade. Mr. Hunter advocated the amalgamation of the Presidency banks as the joint

credit in that case would, in a time of crisis, be stronger than the credit of individual banks. He did not feel secure about the present position if a cricis should occur as each bank was tied up in its own Presidency. Mr. Hunter stated that the State Bank would be able to extract a part of the Indian hoards, as it would create confidence in the minds of the public, because it possessed the prestige and responsibility of the Government. Questioned as to whether the State Bank should include as one of its functions the lending of balances to agriculturists or rather to the Co-operative Credit Societies, Mr. Hunter replied that that should be made within certain limits. In his Memorandum, Mr. Hunter had suggested as one of the functions of the State Bank the control of the Paper Currency. The Government would have to receive certain remuneration calculated on the average of their profits accruing from note circulation for the last two or three years. He suggested Government audit of the bank's business but did not think it essential that Government should be represented on the Bank's Directorate, though responsibility would be largely left with the Government. He further stated that Government should be guided largely by advice of the Bank as to fresh coinage of rupees.

Mr. Hunter was for granting the State Bank power to borrow in London and he stated that it was not likely that exchange banks would object to it, if proper safe-guards were provided in the exchange business.

Mr. Le Marchant who was formerly a member of the India Council and sometime a member of its Finance Committee and also one of the Indian Currency Committee of 1898, raised three difficulties in regard to the working of the State Bank. They were (1) the possible interference with the exchange banks, (2) the difficulty of finding the right way of representing the bank in London, and (3) the possible expense of setting up the numerous branches and the incidents attaching to banking on a large scale. There was, in his opinion, the furthur difficulty of advances. If they were restricted, the bank would not enter sufficiently into the commerce of India; on the other hand if they were to be on a large scale, there were, he pointed out, all the risks to the Government of being identified with the business. Mr. Le Marchant further explained that the Indian State Bank would differ from similar Banks in other countries, in that the former would have to lend the Government only what it got from them. He thought that the purchasers of Council bills preferred dealing with the Government through the Bank of England rather than through any other agency. Further there was the risk of the Bank becoming another Government Department and in his opinion, the argument that the Bank would assist the Government in support of their exchange policy was no longer of importance; and the Secretary of State and the Government of India would not be entirely relieved of their responsibility.

Mr. Charles Campbell Mc Leod, representing the Bengal Chamber of Commerce and the East India section of the London Chamber of Commerce, did not agree that a State Bank was required at present. He did not think that the amalgamation of the Presidency Banks would render their cash more available for the general use of the country. A State Bank, he considered, was not necessary for the encouragement of Co operative Societies; further, notes issued by such a bank might not be in popular favour and the facilities for promoting notes would decrease.

Mr. F. W. Newmarch, Financial Secretary to the India office, imagined there was no reason for handing over the note issue to a State Bank.

Mr. Marshall F. Reid, C.I.E., member of the Bombay Legislative Council advocated the establisment of a State Bank for the following reasons :—

(1) The control of the finances would be in the commercial centres where the money is wanted and where large financial operations take place.

(2) It would control the balances and reserves, and make them available, as far as might be desirable, to trade.

(3)It would 'guide' the people as to the best form of currency they would use.

He agreed to the amalgamation of the Presidency Banks. He thought that agriculture would be benefited. With regard to its functions, he assigned the lending of the balances, the management of the currency and the sale of the council drafts. He deprecated the idea of the Bank dealing largely in exchange. Mr. Reid said that Government guarantee would have to remain on the notes issued by the Bank.

Mr Harry Marshall Ross representing the the Bengal Chamber of Commerce did not favour the proposal of a State Bank. But he said that certain advantages could be derived from it, if established. He preferred the amalgam tion of the Presidency Banks. He did not advocate the sale of Councal bills by a State Bank as that would raise the jealousies of the Exchange Banks.

Sir Alexander McRobert of the Cawnpore Woollen Mills stated that there was no room for a State Bank. To begin with, India could not utilise the capital which would be provided by a large State Bank, neither could it be as efficient in working as the Presidency Banks. In his opinion, it would not relieve the Government of India of any of its responsibility. He did not think that the control of the currency, the exchange business, and the management of the Paper Currency should be included in the functions of the State Bank. He approved of Cawnpore being made its Head-quarters in case it is established.

Further, he stated that the State Bank would not be in a stronger position than the Presidency Banks in meeting a crisis. He thought that there was no difficulty in financing trade in India at any time.

Mr. Alfred Clayton Cole, Governor of the Bank of England, thought that a State Bank might be advisable, but he did not possess any definite knowledge as to its practicability. He considered the continental nature of India a possible difficulty in its realisation. He stated that the currency business was very well done by the Indian Government. He said that securities should be taken for deposits with London Banks. With regard to the question of the issue of debentures by the Bank, Mr. Cole stated that what they wanted in India was a bank big enough to give security for the Government to bank with it.

Mr. H. F. Howard, Collector of Customs, Calcutta, examined on behalf of the Government of India said that opinion on the State Bank would depend on the kind of scheme that might be proposed. He stated in his memorandum that the Presidency Banks would answer the purpose of a State Bank, if permission were granted to them to borrow in London.

Messrs. J. A. Toomey and T. Fraser, representing the Exchange Banks, raised some difficulties to the amalgamation of the Presidency Banks and said that the area-factor was formidable. They feared that the State Bank would drive the Exchange Banks off the field and would create a monopoly in banking in India. They thought management of the Currency by a State Bank an impracticability.

The Hon'ble Mr. Webb of the Karachi Chamber of Commerce did not see any very great advantages from the institution of a State Bank, nor would any advantage resulting from it outweigh the disadvantages. Further he stated that there was no organic demand for it in India. It was conceivable that a State Bank would bring out some of the hoards of the amasses in India.

Mr. Thomas Smith representing the Government of the United Provinces did not see any advantages from the establishment of a State Bank, nor from the amalgamation of the Presidency Banks. He did not think that the Note Currency would be better managed and the circulation of notes, in his opinion, would be affected at first even if the Government guarantee continued.

Mr. M. R. Sundara Aiyar, Secretary to the Economic Assosciation, Madras, raised objections to the establishment of a State Bank, similar to those of Mr Smith. Pressed by Mr. Keynes as to the relative popularity of the Currency notes and the proposed Bank notes

with the Government guarantee, Mr Sundara Aiyar replied, "I would say there is a feeling in the mind of every man who has got a note (Government Currency note) in his hand that he can immediately turn it into cash, as the Government is responsible for its payment immediately whenever he wants the money . . . . . Indians will not have the confidence in a bank circulating its own notes." Further he thought that the Bank would be of little service to the cultivators.

Are we near the Gold Output Limit?

Mr. H. C. Hoover, in a recent article in the New York *Sun* reviews the future gold production of various countries thus :—

The placer gold of Europe was practically exhausted in Roman times. Lode mining there is a small industry and every foot of ground is known In Asia the Chinaman has washed the gravels from Siam to Tibet and Mongolia centuries ago. In lode mining I can say from three years of exploration there that he has long since exhausted the mines down to water level and if mines do exist it will be a very slow business finding them.

NO GREAT EXPECTATIONS FROM CENTRAL ASIA.

I do not myself believe there exists in China or Central Asia a district of such importance as to materially affect the question, for no greater illusion exists than that the Chinaman has any prejudice against mining for gold—when he can make a profit. And he can make lode mines profitable by hand labor on which we could not earn a cent with the finest machinery ever built.

In India, mining has been going on for thousands of years. The placer deposits are exhausted and in the only lode-mining district of importance we discovered, the mines are now 3,500 feet deep and are becoming very difficult to operate. India has been decreasing its output for the last six years, and it will inevitably continue to do so.

In Asia Minor, the alluvial gold has been exhausted since Crœsus's time. There may be some lode mining, b striking fact that none of the districts that were worked by the ancients—and they worked everything they could find—give any evidence of large volume.

In Egypt, hundreds of ancient workings have been opened up during the last few years to the grief of the operator. In fact all mines in these old civilizations, Egyptian, Chinese Central Asia and India, were worked by slaves or convicts who were fed with impressed food, so that all of the metal was profit, and thus hundreds of deposits were worked which prove of no use to the modern operator with all his appliances. And it is scarcely probable that the ancients deliberately chose the worst deposits.

In Australasia, the placer industry is in its dotage. The lode districts within the periphery of say 300 miles from the coast line, are in their decadence, the great interior desert is partially unknown but has in recent years been much traversed. The districts in the interior so far discovered, such as Coolgardie, Kalgoorlie, etc., are all decadent. The maximum output from Australasia was reached about five or six years ago, and it has been steadily decreasing ever since.

U. S. DREDGE PRODUCTION HAS PASSED ITS ZENITH.

Placer mining in the United States made a recovery from apparent extinction a few years ago by the rise of the dredging industry ; this has passed its zenith and the output will soon begin to decrease if it has not already done so. Lode mining has had no accessions since the Nevada discoveries of ten years ago. Altogether the outlook is decidedly toward diminution of the output, for lack of sufficient new recruits to fill the places of those producers now imminent of death.

Canada poured a vast quantity of gold out of the Klondike hand-worked placers, but that stream has become but a trickle from the giant dredges now being built to work over the leavings of the early pioneers. Elsewhere, even with Porcupine thrown in, that country cannot, from anything in sight, maintain its average of ten years ago, although the unknown territory in that country is nascently more

pregnant of new mines than the now well prospected countries further south.

Siberia has been vaunted as the future gold source of the world, and gold is wonderfully distributed over that country. But so are dismantled mills and abandoned dredges—a confirmation of the opinion of all engineers of experience in that region, that but little of the area promises profitable mining. Some hope does, however, exist for successful new dredging areas in the extreme North-east.

South and Central American placer gold was practically all seized by the Spaniards. The lode mining has had English capital poured into it for generations. One company is over a century old. And on balance, only a loss has resulted.

THE RAND WILL NOT INCREASE ITS OUTPUT.

On the Rand, which produces over one third of the world's gold, the mines are already becoming fairly deep (there are considerable workings at more than 3,500 feet), the ores are becoming poorer with depth, the profit to be won from the shallower areas was vastly over estimated, labor and physical conditions are steadily becoming more difficult, working costs are rising and grade of ore falling. This district will certainly not materially increase its output, and I should not be surprised to see an appreciable decrease within twelve months. It will go on producing gold for fifty years, but in steadily diminishing quantity and even ten years will see a great decrease.

Outside of the Transvaal, there are two large areas known in Africa, that is Rhodesia and West Africa. The gold deposits of Rhodesia are mostly the erratic quartz type, and *en bloc* cannot be expected to return the money invested. The British public has invested this money under the glamor of the Rand, and will not repeat very often the game of spending $20 of labor and material to get $10 in gold.

West Africa has been vastly over-estimated, and the tombstones of English companies who have been operating there are now being set up by the score. There are some unexplored places on that continent but they are much less than is currently believed by those unfamiliar with the vast amount of prospecting that has been in progress during the last fifteen years. Large areas of the Congo Free State, Uganda, Nyassaland, Nigeria, Sudan, Sahara, etc., have been demonstrated to be geologically unfavorable, and the probability of any gold industry is of the remotest kind in these territories.

OPPORTUNITIES FOR IMPROVED METHODS NOT IMPORTANT.

It is not my point that no new mines will be discovered ; it is that great districts are unlikely and that the annual supply of new isolated mines will not replace the frail and dying members. The great opportunities for the application of newly discovered methods have all been taken advantage of ; no industry has had such a generous supply of capital for every warrantable enterprise. Further the opportunities for improvement on modern methods, and thus the renewed play of lower-grade or refractory mines, are no longer of importance. The increase in percentage recovery from 60 per cent. to over 90 per cent. offered many opportunities and realized much increase in production, but the region for expansion between 92 per cent. and ultimate 95 per cent. is small.

The cost of working has been reduced to near bedrock by mechanical equipment, until the room for further improvement amounts to cents per ton and not dollars as it was formerly. And in this last connection the cost of wages and supplies in this industry is increasing like all others and will more than offset any reduction due to improved methods. The working costs on the Rand, in Australia, in Russia and elsewhere show a considerable rise during the last two years. This in itself will tend to diminish the output.

Land Banks.

At the Co-operation Day celebrated recently by the Triplicane Urban Co-operative Society, Mr. G. Venkataranga Rao M.A, read an interesting paper on "Co-operative Land Banks."

He said that the principle of co-operation was familiar to the Indian people and reached a high standard of development in the institu-

tions known as " Village Communities. But its application to the organisation of credit was not as well understood and practised as it ought to be. The duty of every educated Indian was, therefore, to re-kindle the old faith in collective action and help towards the extension to regions undreamt of by their ancestors. The load of debt in the Madras Presidency was very heavy, and both the small and large landed proprietors were groaning under it. As a matter of fact, the large proprietors were being weighed down with debt even more than the small ones. The remedy for this state of affairs lay in the development of systematic and stimulating forms of banking, based on cooperative principles, which, while financially assisting the encumbered proprietors, would at the same time train them in the habit of self-help and thrift. To give relief to the impoverished proprietors of land, the Government passed in 1904 the Co-operative Credit Societies Act and further extended its scope in 1912. This beneficent measure had already ushered in a great deal of improvement in the rural economy of the country, by cheapening money, checking improvidence, providing a safe field for investment and fostering a higher morality. But the Act was intended to relieve only small proprietors of land and did not in any way concern itself with relieving the embrassed state of the financial affairs of the larger proprietors. The large landed proprietors in the Madras Presidency, whose number was by no means inconsiderable, were men of no small social prestige and influence, supplying a useful link between the Government and the masses almost entirely agricultural. Their position as poprietors of large estates fitted them to take the lead in agricultural improvements and in the management of industrial enterprises, which the peasant proprietors could hardly be expected to undertake. Though they formed an idle dissipated class in the past they had now begun to realise that if they did not keep pace with the times, they would lose their social influeuce and importance. But a large majority of this class was hopelessly in debt and stood in need of cheap credit as much as the cultivator. Their only recourse at the present moment was the capitalist money-lender, who catered to their needs in terms either extremely onerous or else humiliating. If they wanted to improve their condition they must organise themselves into a body and start an Association, based on self-government and common ability in which the borrowers themselves would be members and where the interest of the borrowers and of the lenders would be identical. The possibility of an Association like this for the regeneration of the landed classes was first conceived by Frederick the Great of Prussia, who, in 1769, established a Co-operative Land Bank in Silesia, the landed proprietors of which had become greatly improverished as the result of the Seven Years' War.

The problems of credit in Western countries were not dissimilar to those of the East. What had been achieved by means of co-operation in Europe could also be achieved in this country. Besides the remarkable success that so far had attended the experiment of organising rural credit under the Co-operative Societies Act, encouraged the hope that the further extension of Co-operative Credit on the lines suggested would prove a success.

After referring to the attempts that were being made by the Madras Landholders Association for the establishment of a Landholder's Co-operative Bank, the speaker outlined in brief the German method of working Land Banks at the present day. The Land Bankers in Germany granted no loans without the consent of the elected Directorate, a consent given only if the borrower's property fully secured the loan. The Banks also borrowed from the public by means of debentures secured on their mortgages, and then distributed the money in loans to their members, the loans being repayable not in a lump, but by annuities. The Banks received interest periodically from their borrowers, with additional amounts for amortisation, and themselves repaid the debenture holders.

Lastly, the speaker said that if Land Banks were opened in the Madras Presidency, much good would result, and it would prove the beginning of a new era for the progress and prosperity of the landed proprietors.

Some Risks of Share Holding.

Mr. T. Good draws attention to some shareholding hazards in the October number of the *Financial Review of Reviews.* He begins by saying, that none but the most experienced and observant of investors have any adequate idea of the multitude and magnitude of dangers involved in Ordinary shareholding, compared with the case of Debenture holding. To indulge successfully in ordinaries one needs ample funds, ample time, and ample good sense—funds enough to invest in a variety of concerns, time enough to study commercial and economic factors and forces, and good sense enough to profit by such study. It is practically impossible to select an Ordinary share that is not speculative. It is true that the buyer of Ordinary shares stands a chance of gaining more than the investor in Debentures; but he runs a ten-fold risk of losing. While the Debenture is solidly secured on fixed assets, the Ordinary is unsecured and exposed to every business danger known. The cardinal fact is that Ordinary shareholding is not investment, but speculation.

An analysis of the accounts and stock fluctuations of almost any dozen, score, or hundred companies would tend to show that more Ordinary shares have depreciated than have appreciated, and that the losses in the aggregate, outweigh the profits or dividends.

" The fundamental fact is that the Ordinary shareholder is really the business man, carrying every difficulty, exposed to every danger, with his capital usually resting on nothing more substantial than the whims of customers, the vagaries of the weather, the designs of labour agitators and predatory politicians. A strike, a freak Budget, some fantastic municipal enterprise, a war, a rumour of war, a fire, a crop failure, a change of fashion—any of these things may temporarily cut down the profits of a business and leave the Ordinary shareholder without a penny of dividend and with the value of his investment seriously shrunken, while the Debenture-holder sits secure, enjoying his interest, his capital resting safe upon the solid assets of the enterprise."

Yet another trouble lurks here for the Ordinary shareholder. Whenever there is any straining and there happens to be a strike for higher wages, business is temporarily dis located, production decreases, profits diminish, that year and the whole burden falls upon the ordinary shareholder. But debenture interest is not cut.

New inventions constitute another danger for the Ordinary shareholder. In a manufacturing trade, say, a new machine is invented. This renders the old machine obsolete. The most wealthy companies in the trade buy the new type of machine; all the others have to do likewise, or be ruined. The current profits, and possibly the reserves, are eaten up by the cost of purchasing the new machines, and a few years must pass before the benefits can accrue. Meantime the Ordinary dividend payments are suspended. An improved method adopted by a rival company may create competition so keen that others have to fight for their existence for a while. The cost falls upon the net profits and the Ordinary dividends. If a company is finally beaten, and has to be wound up, the Debenture-holder steps in like a landlord's bailiff, entitled to a full twenty shillings in the pound satisfaction —the whole assets up to the value of his capital are at his command—while the Ordinary shareholder has to be content with the remainder, if there is any remainder, which is not often.

"Advance, India."

The author of this book, Mr. M. De. P. Webb, C. I. E., is well-known to Indian readers as an unsparing critic of the currency and financial policy obtaining in India. He has freely used his pen to expose the errors of the India Office in the management of Indian Currency and Finance and it is due, not a little, to his efforts that the Royal Commission on Indian Currency and Finance was appointed. The 'Advance, India,' now published is mainly a collection of Mr. Webb's writings and is a valuable hand book explaining the Indian stand point. In the first part of the book containing 15 pages, Mr. Webb appeals to English readers to equip India with "the best possible metallic currency and best possible monetary system that British experience can suggest." The second part containing seven chapters is a revised reprint of the articles contributed by him to several Indian newspapers, some of which have been already noticed in this magazine. The third part contains the text of the author's evidence tendered before the Royal Commission ; and the fourth part or the conclusion of the book explains why "India's advance means not only increased strength and prestige for India, but also increased strength and prestige for the whole Empire." We heartily commend this book to all who are interested in the currency and financial problems of India. It is published by Messrs. P.S. King & Son, London, at 5/ nett,

The Educational World.

The Educational Value of Agriculture.

Some of the advantages of instruction in elementary agriculture are described in a recent issue of the *Experiment Station Record.* It is pointed out what when well given, the advantages of this instruction are as follows :—(1) It commands from the beginning a wide range of the interests most common to children ; (2) it forces measures and comparison and judgment thereon, upon the child at every turn ; (3) it trains a child to be careful, exact, patient and persistent ; (4) it offers in the gardening work all the elementary problems of form, color and proportion, and so lays the foundations of a sense of beauty ; (5) it affords abundant opportunity for emulation and co-operation; and (6) it teaches boys and girls to work. Inasmuch as it discourages pure reasoning, students should also be taught pure mathematics, logic and languages. The author points out that "our trouble in the past has been that we have tried to take our school children directly into this abstract world of direct thinking and exalted feeling without passing them through the preliminary stages of concrete experience, elemental virtues and active self-expressions."

Domestic Economy in Schools.

Schools of domestic economy for girls were established in London by the late Technical Education Board in 1893. Their purpose is "that of training girls—not for domestic service, nor for any special industry, but as home-makers." A memorandum by Miss Cade and Miss Gordon in a recent report of the London County Council says there are now eleven of these schools in the county area. Of these, three are conducted in London County Council technical institutes, and eight in polytechnics and aided institutes. These schools give one year's course of training in the domestic arts to girls leaving the elementary schools. About 500 scholarships are awarded annually by the council. These give the holders free tuition, materials, and dinner daily, together with £3 a year maintenance grant. The bulk of the pupils in these schools are scholarship holders. The number of fee-paying pupils is small. Instruction is given in the principles and processes of cookery, laundry-work, home-dressmaking, needlework, and housewifery. An interesting development of the teaching of housewifery has been initiated at the Shoreditch Technical Institute. The new premises of the school contain a flat, in which the girls reside in turn during their school course. The course of work done in these schools has been most carefully thought out, and has proved of great practical value to the successive sets of pupils who have passed through them.

Indians in England.

At a meeting of the London East and West Society, held at 21, Cromwell Road on August 18, Mr. M. R. Sundara Iyer, B.A., B.L., Secretary of the Economic Association of Madras and a witness from Madras before the Royal Commission on Indian Finance, gave an address on 'Indian Students in England : the Economic Aspect of the Situation.' Mr. Iyer first dealt briefly with the economic condition of India under the three heads, land, labour and capital, and stated that land in India was steadily going out of cultivation, labour was going abroad, and capital was almost entirely foreign. Referring more specifically to the training of technical students abroad, he argued that it is impossible to train men anywhere else than in India to meet the demands of a market which continually varied, not only from province to province, but almost from village to village. He quoted with approval the recommendation made by the recent committee on State Tech-

nical Scholarships under the chairmanship of Sir Theodore Morison, that no student should be sent abroad for technical study until he had had at least one year's practical training in his subject in India. Mr. Iyer touched upon the danger of the European-trained student forming a new caste when he returned to India, instead of going back to work among his own people and endeavouring to pass on to them some of the benefits gained from his European education. In his opinion the hope of India lay, not in the sending of large numbers of her students abroad, but in the establishment in India of technical universities staffed with first-class European experts.

In the discussion which followed the address, the policy of sending Indian students abroad was generally supported, but emphasis was laid upon the need of more careful selection of the students, and insistence upon previous practical training in India. It was pointed out that with the spread of education in India the prejudice against the scientifically-trained man would diminish, while the number of openings for such men would increase. The chairman, Sir Frederic Lely, K.C.I.E., in summing up, said he hoped the lot of the returned technical student was not so unfortunate as some of the speakers had suggested, and added that, in his opinion, the establishment of up-to-date technological institutions in India must necessarily be preceded by the sending of students for training to other countries.

Chautauqua : a System of Popular Education.

"Education ends only with life," is an ideal in all other countries ; but in America it is a practical realisation. This is consummated by a system of popular education known as the Chautauqua system, founded in 1874 by Lewis Miller and John H. Vincent. The home is the college and school and everything else, and the tuition is done by correspondence and by means of popular lectures. Some twenty or thirty people gather together, perhaps once a week, and arrange profitable lecture courses. Here is a copy of one of the programmes :—

(1) Roll-call: Answered by quotations from Iliad and Odyssey.

(2) Summary of chief points in "Rivalry of Nations" Chapter 14.

(3) Reading from the "Shrinking Earth" (from December *Chautauquan*).

(4) Singing : "Recessional"—Kipling.

(5) Map-Review: Each Greek State assigned to some one member, who takes the rest of the Circle on a brief imaginary trip, pointing out the location of cities, mountains, oracles, temples, etc.

(6) Debate: Resolved that England was justified in allowing Greece to be beaten in 1897.

An interesting description of the system is supplied to the October number of the *Modern Review* by Rafiddin Ahmed He says that the idea of Chautauqua is to hold up high ideals before the people, and make the masses understand their responsibility. It is to make better towns, better homes and to inspire young people for higher things and to give the old sinner new hope.

Human Geography and Industry Planning.

In a paper presented before the Birmingham meeting of the British Association for the Advancement of Science, Mr C. R. Enock maintained that the economic problems before the world at the present time call for the establishment and exercise of a comprehensive and constructive science, whose aim would be to evolve and teach the principles under which economic equilibrium in the life of communities may be attained. It was argued that the real science of living on the earth, or "human geography," the adaptation of natural resources and national potentialities to the life of the community, has never been formulated. The congestion of the population in towns, the desertion of the countryside, the high cost of living, low wages, unemployment, and so forth, are related phenomena, intimately connected with the conservation and development of natural resources. The axiom was advanced that the world is capable of supporting all its

inhabitants in sufficiency, and its failure to do so is due to the non-emergence so far of an organizing science, whose deliberations would be aloof from egoistic or partisan influences. It was affirmed that the teaching and operations of such a science were necessary if social security is to be maintained and civilization advanced; and it was suggested that to give effect thereto an institution should be established which would bear the same relation to the science of living as their corresponding institutions do to physical, geographical, medical, and other sciences.

Technical Education.

When technical education was introduced in India by Government some three decades ago it was 75 per cent. text-book and only 25 per cent. technique. The former could only encourage memorising in which the Indian student is already an adept; and the latter was inadequate to teach manual dexterity even as much as is ordinarily possessed by a common workman. The Indian student learnt the terms of labour in English and could by no means make himself understood by his workmen. So, it is no wonder that the "experiment has been a costly failure" as remarked in an editorial note by the *Indian Textile Journal.* The same journal proceeds to contrast the English technological student with his Indian *confrere.*

"The training of the students had been copied from that of another country where all men can read, where the student studies in the local language, and has a technology in common with the workman. Further, the English technical student well knows that if he does not qualify as a craftsman, he will be despised by workmen and will receive little consideration elsewhere." "Is it any wonder, then," asks the journal, "that even in Bombay, after a quarter of a century of exercise, the influence of the Victoria Jubilee Technical Institute is not traceable among the various craftsmen who build and furnish the houses we live in, nor among the building and other contractors? What then is to be said of the rest of India?"

And the few really successful technical teachers, such as foremen in railway and other workshops, and certain missionaries who deal directly with the worker, are not in the Educational Department.

This deficiency in technical education has been noted and the celebration of the twenty-fifth anniversary of the Victoria Jubilee Technical Institute, Bombay, which was held on the 5th ultimo, seemed to mark the parting of the ways which will separate technical instruction from that of literature and pure science. The *Indian Textile journal* observes:—A new work now lies before the Technical Institute,—the training of a new class of primary technical teachers selected from among young and steady skilled workmen and trained to impart the elements of craft in vernacular on a non-literate basis to the rising generation.

Educational Work in Mysore.

From the address of the Dewan of Mysore to the Dasara Representative Assembly, we gather that the past year was one of more than usual activity in educational matters. The number of public and private institutions increased by 90 and the attendance by 7,226. The percentage of boys at school to the male population of school-age rose from 30·1 to 31·3 and that of girls at school to the female population of school-age from 6·2 to 6·8. The number of pupils under instruction in comparison with the population of the State gives a percentage of 2·9. A special grant of two lakhs and a half-one lakh for opening new primary schools and improving the existing ones, and a lakh and half for the construction of village school buildings was sanctioned during the year 1912-1913. From these grants, 141 new primary schools were started in the different districts of the State. A Central Boarding School in Mysore for the Panchama boys has been started and it was fully availed of. The number of industrial and weaving schools increased from 22 to 23. The number of public institutions for girls rose from 305 to 360. A similar grant of $1\frac{1}{2}$ lakhs of rupees has been included in the current year's budget for 1913-14.

The two first Grade Colleges are nearly complete and the question of opening honours course classes in certain branches in the near future is under consideration.

The Government has approved of a scheme of elementary and advanced Technical and Commercial education. The scheme consists of the establishment of the Chamarajendra Technical Institute at Mysore, and a Commercial and a Mechanical Engineering School at Bangalore. The present Engineering School and the Industrial School at Mysore will be combined to form the nucleus of the new Chamarajendra Technical Institute. The institute will consist of 5 sections, viz., the Engineering Section, the Industries and Crafts Section, the Fine Arts Section, the Commercial School Section and the Workshop.

The Commercial School at Bangalore provides for an elementary course in Commercial subjects in English and Kannada for one year and a secondary course in English for two years. Arrangements will also be made for the delivery of lectures of an advanced character by specialists on Commercial subjects, Economic science, Statistics, Public Administration, Banking and other allied subjects.

The Mechanical Engineering school would undertake to teach the management and care of steam and oil-engines, erection of machinery, working of mills, electric work, driving motor cars and other subjects.

A proposal is under consideration for the opening of a printing class in connection with the Commercial School where the instruction imparted will be free and of an elementary character until the public see the advantages of such instruction and utilises it in large numbers.

Openings for Technical Men.

At the last Fyzabad Industrial Conference Mr. Ayodhia Das of Gorakhpore made a speech in seconding the resolution on technical education. He said that the progress of every modern country depends upon its industry which in turn depends upon manufacture. Here though there is a great superficial cry about industry, very few families try to send their children to Technical schools. In Gorakhpur, for example a large number of boys are always refused admission in the three high schools, but very few attend the Technical schools. The headmasters of the various schools never send or even try to send good and bright boys to the Technical Institute, but, on the other hand, only such boys are sent there as are thought to be fit for nothing else. Technical education, like every other education, requires intellect and brain, and it is a mistake to think that merely drones and intellectually weak men are fit for industrial training. This complaint is not only confined to headmasters and heads of various educational institutions, but applies equally to such parents who, though outwardly crying for the industrial development of the country, never seriously attempt to send in their children for sufficient training for the industrial revival of the motherland.

Their first idea is to pass out as graduates or the matriculation and school-leaving examinations in order to qualify themselves as ordinary clerks. In the opinion of Mr. Das it is a mistake to think that industrial education offers no opportunity for material prosperity. An ordinary mechanic or fitter who has had a 3 or 4 years' training in any Technical Institution can easily earn from twelve annas to three or four rupees per day; while an ordinary clerk can seldom earn more than Rs. 30 per month. For those who have received a higher Technical education, there is plenty of field in after-life. Out of the 66 students sent by the Government to receive Technical education in Europe, 31 returned to India. Of these, 26 received good employments, 1 joined the bar, 1 died and of the remaining 3, no information is available. Out of 80 students sent by the institution for advancing scientific and industrial education in Bengal, 28 received good employments, 9 started factories on their own account, 19 were employed under the Government and 24 have so recently returned that they have not yet

settled. In view of the above figures, it can hardly be said that those men who have gone abroad for Technical education have not been able to find sufficient employment on their return.

Where Germany Leads.

In Mr. G. Waterhouse's opinion, which is well expressed in *Everyman*, Germany leads the world in University education. Mr. Waterhouse desires England to learn much on this subject from Germany. The writer claims that Germany's system of of university education is, by reason of the number of her universities, the strength of their staffs and the quality of the instruction given, a model to the world. The University of Berlin is second only to that of Paris with regard to the number of students (10,000) in residence, and second to none with regard to the reputation of its staff. There are, for example, ten ordinary professors of Theology, twelve extraordinary professors and lecturers. And yet the theological faculty is the smallest of the four. The legal faculty boasts twenty-four ordinary and extraordinary professors and eight lecturers, the medical faculty seventy professors and one hundred and twenty-six lecturers, and the philosophical faculty one hundred and eighteen professors and hundred and eighty-seven lecturers. What other European University provides twelve courses of lectures on Chinese, six on Japanese, thirteen on Modern Arabic, and seven on Turkish, in addition to such trifles as English, French, Italian, Spanish, Russian, Swedish, Danish, Polish, Sanskrit, Hebrew, Syriac, Assyrian, Aramaic, Egyptian, Finnish, Tibetan, Amharic, Ethiopian, Persian, Swahili, Hindustani, Guzarati, Haussa, Modern Greek, etc.? And possesses twenty other universities.

Certainly, the world's best languages both ancient and modern are taught in the German Universities. It may be remembered that German scholars have translated a good number of the best works in the Sanskrit literature of India.

The article under review is mainly concerned with detailing the more material advantages enjoyed by the German student. Ridiculously small, says the writer, are the charges required by the German student for subsistance, compared with what the English student has to spend. The college system is, of course, unknown, and of supervision by the University authorities there is none. The students live either with their parents or in ordinary lodgings. The price of a room, including light breakfast and attendance, varies from seventeen to thirty-five shillings a month, the average price being about twenty-five shillings. Food is equally cheap. In towns like Berlin and Leipzig a five-course dinner usually costs a shilling or one and three pence, including a pint of beer and the waiters up. Indeed barely at a stone's throw from the Royal Palace, Berlin, the writer regularly received, it appears, five courses for seven pence.

Instruction through Post.

The following appears in one of our contemporaries :—

Some time ago correspondence teaching of any sort was looked upon with much doubt, and the statement that technical training by post was possible was felt to be insufficiently proved. Time has since shown us, however, that correspondence training is in reality one of the most efficient and practical plans of technical education ever devised. There are now several big Correspondence Colleges in England, the largest being the International Correspondence Schools, Ltd., of Kingsway, London. This Institution has turned out thousands of genuine successes in the various trades and professions taught, and their educational work has been investigated and is recognised by Statesmen, Educationists and Employers alike. This one concern can boast of over 200,000 students in the British Empire alone. This, in itself, is sufficient proof of the success of correspondence teaching. After all, teaching is simply the imparting of knowledge, information and experience, and the developing of the mental powers of the student. Correspondence training, then, means the abolition of spoken and the extension of written teaching,

i.e., written lessons in place of spoken lessons. The problem to be solved in correspondence training is that of dispensing with oral tuition and substituting something better. The solution is simple; what the teacher does by word of mouth must be done by the printed word. The ordinary class method is to use a Text book or Lesson Book, the teaching in which is supplemented by the instruction, comments and explanations of the teacher. Therefore, for the correspondence student, such additional instruction, comments and explanations must be made part of the printed lessons. In class teaching, such comments etc., come from the one teacher, who must always be limited both in knowledge and the ability to impart it. In correspondence teaching, a group of teachers instruct each student, just as a group of writers, working under the guidance of an editor in the columns of a newspaper or the pages of a magazine, convey information to each individual reader of the publication.

In the case of class teaching the student, if quick, cannot be hastened along without injustice to others not so quick; if he is absent from a lesson, the missing link in his training is very difficut to replace, the hours, frequency and place of a class meeting are made for the convenience of the class as a whole, not for that of the individual student. All these difficulties are avoided in correspondence teaching for the student works entirely at his own convenience; he is a class by himself, and can study anywhere he chooses.

Though the above is merely a glance at this important question, it will serve to show that once an open-eyed unprejudiced view is taken of the subject, it will be seen that in all circumstances correspondence tuition is as natural and as effective as oral teaching, while in many it is not merely a superior but the only possible method, particularly here in this country.

Indian Engineering Students in England.

The following is the text of a memorial which has been submitted to the Secretary of State for India by the Indian Engineering Students in England:—

There are about 140 Indian students studying Engineering Science in Great Britain, and a course of practical training is essential to the attainment of efficiency in the profession; but, unfortunately, they find it extremely difficult to get into Engineering Firms and Works, due to the lack of proper influence. They are more adversely placed than the natives of this country, who can easily arrange for their work, and mostly without paying any premiums, through the influence of their parents, friends and relatives. The few of us who can arrange for such practical experience have to pay heavy premiums

But the case of the students belonging to some of the Scottish Universities (numbering about half the total) is more deplorable. Under the sandwich system, the Engineering Departments of these Universities remain closed for six months from April to mid-October, to enable the students to gain practical experience in Engineering Firms and Workshops, so that theoretical training at the Colleges may go side by side with practical knowledge outside; so that if these students cannot arrange for practical work, the spirit of the system is wholly neglected, and they are forced to sit idle during six months in the year.

Now we are convinced that through the India Office, arrangements can be made for our training without any difficulty, and beg Your Lordship's leave to suggest that the Indian Government make a rule (as it is done by the Japanese Government) that every Government Contractor or Engineer must take a number of Indians (recommended by the professors) into their firms as apprentice Engineers and give them facilities to learn the work. This will not place the Indian Government under any financial or other obligations (as no firm will hesitate to accept this rule as part of the specifications) but will be of immense advantage to the Indian students.

In the year 1909 the Secretary of State for India in Council made a rule that a maximum of 10 per cent. of the appointments for the

Imperial Service of the P.W.D. should be given to Indians, if otherwise found fully qualified. Since then the number of Indian Engineering students in this country has increased fourfold, and therefore we feel bound to approach Your Lordship to so modify the rule as to give Indians a substantial share in the appointments referred to.

The anxiety of the Government of India to have as many capable Indians as possible employed in the Engineering profession is shown unmistakably in their circular letter to the Local Governments on the Atkinson Report on Technical Education in India, from which the following is an extract:—

"It seems to the Government of India that the time has come to endeavour to connect Educational Institutions closely with business firms, railways and others employers of labour, to enquire how the former can better meet the requirements of the latter, and to point out the way to further the employment of Indians in them."

Nothing can promote the object of this most commendable endeavour more than to lead the way and to employ for the State as many Indians as are found qualified.

A number of Engineers are appointed every year in the covenanted service with an agreement to serve a limited number of years in India (most of whom are afterwards transferred to Permanent List); Indians up till now had no share in these appointments, and we beg leave to suggest that these and other Temporary Engineers be appointed in India from qualified Indians (whether trained in this country or in India).

The existing distinction between the Imperial and Provincial Engineering Service is wholly prejudicial to the aspirations of the Engineers belonging to the latter service, and we strongly request your Lordship to remove the present barrier, throwing open the Imperial Service to the members of the Provincial Branch.

The School for Waiters.

The prospectus of the Day Technical Schools for boys for Cookery and for Waiters at the Westminster Technical Institute gives an account of an interesting experiment which is being conducted by the Education Committee of the London County Council. The Cookery Technical School was established in 1910 with the object of providing a course of instruction for boys in all branches of cookery and the making of pastry and confectionery. Admission to the school is, in general, restricted to boys between fourteen and sixteen years of age who have passed Standard VI or its equivalent. The school is equipped with the latest culinary appliances, including a central cooking range, gas-cookers, grillers, steamers, etc., also a modern pastry, confectionery, and ice-making department. The course of instruction covers three years, and includes the professional training of the pupils under skilled chef-instructors and the improvement of their general education. The subjects of instruction include practical kitchen work, theory of cooking, kitchen accounts, French, English, Arithmetic, and Physical exercises. Complete menus are arranged and prepared each day, and lunch is served in the restaurant of the school for Waiters to students of the institute. The council does not undertake responsibility for securing employment for boys on the completion of their training, but it is understood that work for all pupils who complete the course successfully will be found by associations interested in the work of the school.

Agriculture at Columbia University.

It appears that gentlemen farmers of New York city do not generally know much about the actual methods used on their out-of-town places. About all they know is that vegetables are raised on them, are supplied to the table in the summer, and that the cost has not been many times the amount they would have to pay to the country farmer in their neighbourhood. When the question arises as to the proper handling of the land under cultivation an expert is called in to give his opinion, a big fee is paid him, and the land works well for a few years, when again the expert is called in and the proper treatment is advised again. This is about as expensive a method of farming as

could be imagined, yet it is going on all the time on hundreds of country places near New York.

To meet this state of affairs, the Department of Agriculture at Columbia is holding a series of lectures by men of scientific training and attainment—in fact, by the very men who are called in from time to time by the gentlemen farmers. While these lectures are necessarily scientific, they are divested, as much as possible, of technicalities, and the New York farmer may easily learn the proper conduct of his farm. The lecturers are drawn from the National or State Agricultural Departments and from the Schools of Agriculture all over the country, many of them having farms of their own upon which the most advanced methods of farming are being carried out.

The aim of the course, which has been arranged by O. S. Morgan, Professor of Agriculture at the University, is to give chief consideration to the fundamental, practical aspects of the various phases of farming that should be weighed by every farmer manipulating land for crop or animal production about New York city. The competent housewife is always able to secure and keep better servants, so the gentleman farmer, who knows the subject, will be able to make his farm a greater success by use of the facts to be learned at these lectures.

Agricultural Instruction in Canada.

Mr. T. K. Doherty, Commissioner of the International Institute of Agriculture in Canada, has communicated to the Bulletin of that institute the gist of a Bill of the greatest importance to agriculture in Canada introduced in the House of Commons, by the Hon'ble Martin Burrel, Minister of Agriculture. The new measure is the practical application of the "Agricultural Aid Act" passed in April 1912, giving power to the Governor in Council to make grants to the Provinces for the encouragement of Agriculture.

On the passing of the Act in Aid of Agriculture, Dr. C. C. James, Deputy Minister of the Ontario Department of Agriculture, was appointed to investigate agricultural conditions in Canada and ascertain in what way the federal authorities could best assist the provinces in developing Canada's basic industry. Dr. James consulted the provincial governments and the men in charge of the various agricultural institutions of the country and the results of his work is the new Bill now before the House of Commons.

The new law is "for the purpose of aiding and advancing the farming industry by instruction in agriculture." The money voted to the provinces under it will be devoted exclusively to agricultural education. The object of the Act is to increase the efficiency and equipment of the agricultural colleges, establish agricultural colleges, establish agricultural schools, dairying and horticultural schools, and short courses in agriculture, and to initiate agricultural teaching in the public schools and work by travelling or located qualified instructors. Educational work will also be carried on by means of demonstration trains and the training of teachers in domestic science and nature study.

According to the terms of the new Bill, $10,000,000 are to be given to the provinces to be expended on agricultural education during the next ten years. $ 7,000,000 will be allotted the first year and this amount will be increased by $100,000 annually until 1917, from which year until 1923 $1,100,000 will be provided yearly.

Speaking broadly, the division of the money among the provinces will be on a population basis. There are, however, slight modifications of this principle. In the first place, $20,000 a year is to be set aside to be divided among such veterinary colleges as grant degrees and come up to a required standard. In addition $20,000 will be allotted to each province regardless of population.

It is provided that if in any year any province is not prepared to use all its grant, the unused remainder shall be held by the Dominion for future use by that province, or until such time as it can make good a claim, or show good cause for its payment. If from lack of educational machinery, or for any other reason, any province is not able to submit a satisfactory scheme, the Federal Government would be prepared to formulate one for such province's assent.

INSURANCE.

Surrender Values of Life Policies.

An interesting article on this subject has been written by that eminent actuary, Dr. A. E. Sprague, M.A. He emphasises that the business of insurance is based on the principle of averages—a large number of persons contributing sums into a common fund, or "pool," which is divided amongst those members who sustain loss by the happening of the event insured against. The owner of a house is liable to the risk of his property being destroyed by fire, and such a loss would be heavy if it fell entirely upon the individual. The risk of fire is small, and by means of fire insurance it is spread over so large a number of persons that the burden upon each is trifling. The individual policy holder incurs the *certainty* of a trifling outlay in order to remove the *possibility* of a serious loss. As the premiums paid to the office each year are only sufficient to meet claims arising in that year and remunerate the office for its trouble and expense in managing the business, it is clear that no return of premium can be made to those persons who suffer no loss by fire. This is now generally understood, but when life insurance is in question, some people still find it difficult to understand why a life office is unable to refund all premiums paid by any policy-holder who wishes to discontinue his policy.

They overlook the fundamental principle of the business, the payment of claims out of contributions received from other policy-holders, in order to spread the individual losses over a large area and thus minimise their effect. It is certain that out of a large number of persons some will die in a year, and, although the *proportion* of deaths can be predicted with comparative accuracy, it is impossible to foresee which *individuals* will die. The insurance office collects premiums from a large body of policy-holders on the condition that it will pay, as and when they die, certain sums to their representatives. The probability of death increases with each year that passes, the increase being very marked as old age approaches. The premium paid for life insurance usually remains of the same amount during the whole term of the policy, being "levelled up" in such a way that in the long run the office receives enough to pay all the claims. This "levelling up" has the effect of making the premium greater at the beginning of the insurance but less towards the end of life than is necessary to cover the risk; and therefore, the claims of the first few years' insurance are less than the premiums received in that time, so that the office gradually accumulates a fund or "reserve" as it is called. After the lapse of a number of years, when the lives become old and die more rapidly, the claims will necessarily exceed the premiums, and the difference has therefore to be met out of fund accumulated in the earlier years. This fund is held by the office for the benefit of the policy-holders as a whole, and if one of them wishes to discontinue his policy it is equitable that he should be entitled to a share of it. This share is what is known as the "surrender value" of the policy.

Now, as the fund is formed only from the balance of the premiums left over after payment of the claims, expenses, etc., it is clear that the total fund will, as a rule, be much less than the total premiums paid, and during the early years it will be only a very small proportion thereof. It follows that each individual's share of the fund (*i.e.*, the surrender value of his policy) must generally be much less than the premiums paid, because a part of them has gone in payment of claims and other policies, and part in payment of expenses. The premiums charged by insurance offices leave little or no margin after paying the first year's claims and expenses. Consequently offices cannot as a rule allow any surrender value during that or even the second year. A rough-and-ready estimate of the surrender value allowed by the best British offices may be arrived at by taking, say, one-half of the premiums paid after the first year under a whole-of-life policy which carries the right to bonuses, or one-third of the premiums paid after the first year under a policy without bonuses. Many offices make it a condition that no surrender value shall be allowed unless at least three years' full premiums have been paid.—*Investors' Chronicle.*

MACHINERY SCIENCE AND INVENTION.

Type-writers to be Superseded.

An invention that threatens to do away with stenographers is causing consternation and alarm among Parisian shorthand experts. This new correspondence device consists of phonographic records on prepared cloth, which may be po ted instead of a letter. The communication is simply dictated into a machine, the result is posted and the recipient inserts the cloth record in his phonograph and listens. The invention was originally designed for use as an exact record of testimony in legal cases; but with further development the discovery can now be used for all correspondence, and, as the records can be put on the market very cheaply, the process is less expensive than the employment of stenographers.

A Rubber Collecting Patent.

"We have been informed," saysthe "*African World*," "by the well-known Hamburg firm of Carl H. Delfs that they have acquried the right to exploit a new patent, the invention of Herr *v.* Hassel, for the collection of rubber. The firm is about to promote an international syndicate to take over the monopoly of the patent. According to the accounts which have reached us, the invention has for its object the reduction in the cost of collecting rubber. It is a simple mechanical device which will do away with a lot of costly labour. It is generally calculated that one man is required, under present conditions, for the gathering of rubber from 200 trees, but with the Hassel mechanism one man can exploit 5,000 trees, and, under the new method the cost of production of the rubber would be about one-third that of its present cost. Another advantage possessed by the German patent is that it tends to preserve the purity of the rubber. It can also be successfully used on trees of an inferior quality."

Blood and the Conservation of Energy.

While the study of the blood is essentially a matter of biological interest, it is a somewhat remarkable fact th t it also furnished the clue to Julius Robert Mayer for his discovery of that fundamental law of physics, the law of conservation of energy. Mayer observed, while travelling as a ship's surgeon in the tropics, that the venous blood of his patients (in the days when blood-letting was still in general vogue) was very appreciably brighter in color than in ordinary practice in the temperate zones. From this he rightly concluded that there was a definite relation between the chemical action going on in the blood and the amount of work or heat furnished by the body, and thus following up his argument point by point, he was finally led to the conclusion that the tolal amount of energy of a given system is constant, that energy can neither be created nor destroyed, but only converted from one form into another.

Mechanical Joints in Human Bones.

Remarkable experiments are being made in San Francisco by Dr. Milton Francis Clark, with a view to substituting mechanical joints in human bones which, through disease or paralysis, have been rendered stiff and useless, says the San Francisco correspondent of the *Daily Chronicle*. The doctor has been experimenting on animals, and has just performed what he is certain will be a successful operation on a dog. The animal had its leg bones smashed and Dr. Clark, without moving the tendons, nerves, veins and arteries has inserted a silver joint, pivoted, it is said, with diamonds. The injured joint was removed, and a silver joint so as riveted to the end of the bones. The doctor used diamonds as pivot for socket joint as being the hardest known substance, and thus able to meet the objections to wear and tear, which in the case of other substances might necessitate frequent operations for renewal. Diamonds, says Dr. Clark, will, last for a longer period than the possible life of any patient. The dog, which is nearly well can move its leg comfortably and Dr. Clark is convinced that it will be able to walk again in natural manner. X-ray photographs of every stage in the progress of the case are being taken, and the doctor is satisfied that he has solved a problem in anatomy which has baffled the best surgeons of the world. His system, he hopes, will supersede the method of grafting living bone and tissue.

HINTS AND RECIPES.

Petroleum.

Among the many other uses of the various forms of petroleum, spindle oil has made a name for protecting wood, leather and other materials against the attacks of vermin. Rats avoid leather that is dressed with mineral oil. Kerosene, although liable to evaporate, will for a time preserve wood even of the most inferior kind against the white-ant. Its effect was tried on some brackets of mango wood that were built into a wall infested with this insect. The wood had received three coats of kerosene previous to its being built in, and after six months, the wood remained untouched.

Castor Oil for Insect Bite.

A simple application to the bites of insects and bee stings, says a medical authority, is castor oil. It allays pain and promotes a speedy cure. If a small quantity of ammonia be added to the oil and the whole thoroughly shaken, it will act even more rapidly.

Banana juice for Snake Bite.

It is said that a drink of banana juice taken from the *tree trunk* if given to any man or animal bitten by a snake will save the patient and make him all right in a few days.

Removing Onion Odour.

If the hands are washed with ground mustard and water after peeling onions or handling fish the disagreeable odour will be removed. Washing the hands in a little strong vinegar will also prove effective, or holding them in the smoke of a burning paper after they have been thoroughly cleaned with hot water and soap is also excellent.

The Value of Paraffin.

Paraffin is useful in every household, and has many uses beyond heating and cleaning. It will, if added to an equal quantity of olive oil, make an excellent machine oil; and, used perfectly pure, will clean the most neglected and dirty sewing machine. Bicyclists need not be told of its efficacy. Mixed with silver-sand to form a stiff paste and applied with a coarse flannel, it will remove all discoloured spots from tiles, etc. Finger marks will disappear from paint if a flannel on which a little of the oil has been placed, be applied. If mixed with powdered "brick-dust" (Bath-brick), and gently rubbed, it will remove stains from brass. Tin may be made bright as new by rubbing with a rag dipped first in paraffin, and then in powdered whiting. If a little paraffin be added to the water in which white goods are being boiled, their colour will be greatly improved. If the pile of velvet be briskly rubbed with a rag dipped in paraffin, and when clean, with a piece of dry flannel, it will be almost as good as new.

To keep away moths, dip old rags in paraffin, place them between layers of news papers, and lay in the boxes or drawers containing woollens. If by any means your store of paraffin catches a light, do not try to extinguish the flames with water, you will only make matters worse. Empty the flour bag, or a pot of earth over the flames or cover with a rug, sacking or any handy article that will keep the air from getting at the blaze.

Test for Drinking Water.

A simple method of testing water for its potable quality will be found of value, especially to people who travel away from the larger cities. When the water is of doubtful quality, place a lump of ordinary white sugar in a tumblerful and cover it with a saucer. Let it remain for a night in any situation where the temperature does not fall below 60 degrees Fah. If in the morning the solution is still clear the water is pure, but if it is cloudy it is impure and to be avoided. It may also be tested with permanganate of potash or with Condy's fluid. If enough of either material be put in the water so as to impart a pink tinge and the colour remains after an hour, the water is safe for drinking, but if it turns a brownish colour it is impure. When this colour settles to the bottom add a little more to restore the pink colour, which if it remains will prove the water to be safe. Boiling the water will generally render water harmless, but does not remove any taste it may have. If first treated with permanganate, which precipitates the impurities in solid form and then boiled, the taste will disappear.

HEALTH AND HYGIENE.

Sugar as a Surgical Antiseptic.

That sugar is a disinfecting and preservative agent is a well-known fact, especially to Indian ladies who always apply sugar to stop bleeding from a cut wound. The fact is also said to have been mentioned by Galen. We learn from *La Revue* that an emnent, German Surgeon, Dr. George Magnus of Munich, who is famous as a traumatologist, recommends it strongly as a dressing for wounds. All saccharine substances are good, but pure cane-sugar or beet sugar is best. Its disinfecting and sterilizing qualities are excellent. It is not injurious to the blood, as has been wrongly believed, and is a better preventive of putrefaction and contamination by microbes than ordinary medical antiseptics.

Separated Milk.

It is desirable that the feeding value of milk from which cream has been separated, should be known. Separated milk contains about 3·15 per cent. of casein which forms about 80 per cent of the total proteid matter of milk and being a nutritious substance the separated milk remains a valuable article of diet. Separated milk also contains mineral matter and when fed to animals helps in bone formation. Though it contains the whole of the protein of the milk, it is nearly devoid of the fat which should be otherwise supplied. It is employed in the preparation of bread, biscuits, cakes, and sweetmeats. It can be used for calf feeding. The deficient ingredient in separated milk as stated above is fat and to make a perfect calf food some carbohydrate must be added in a form easily digestible by the young animal.

Substitute for Coffee.

Efforts have been made to find substitutes for coffee, either as mere adulterants, like chicory, or for the sake of greater wholesomeness or cheapness. Rye and other grains, lupine, acorns, beets and carrots have all been thus used, but the fig coffee or *Feigen-Kaffee*, which has latterly come into use in Austria and elsewhere, is, says a New York paper, a decided novelty. *Les Annales* quotes M. Trabut of Algiers as saying that an excellent coffee can be made from dried and roasted figs, which need not be of the first quality. They are dried in the sun or in evaporating pans, according to climate, and then roasted in ovens till brown or almost black and quite brittle. They are then ground up and the resultant powder is pressed into tablets. These must be kept dry. When made use of they are merely dissolved in hot water. One hundred kilos of the dry figs give 75 kilos of the dry powder. The figs cost 15 francs and the powder sells for 60 francs wholesale and 100 or more at retail so that the trade ought to be profitable if a demand can be created. The beverage is said to be agreeable in color and flavor with a somewhat sweeter taste than that made from chicory.

Red Light as a Preservative of Milk.

Interesting experiments have recently been made concerning the influence of red light on milk. That light as such is detrimental to the conservation of milk has long been known, but which of the rays really did the mischief has only now been determined, when it was found that the red rays are beneficial, while those toward the violet side of the spectrum caused the milk to "turn." Pure, fresh milk placed in an uncolored glass bottle in the full sunlight, and sterilized and pasteurized milk, placed also in uncolored bottles in the same place were found at the end of the day to be completely spoiled and unfit for consumption.

Absolutely no difference could be detected between the ordinary "fresh" milk and that which had been sterilized—both were equally bad. But if even unsterilized milk is placed in a red bottle or in a bottle wrapped in red paper in the full sunlight it keeps perfectly good for ten hours.